

PCPlus CAMPAIGN

➔ Problems with free Net access from Connect 25, Windows disks from Time and praise for a well-known monitor manufacturer

Time to change

Dear **PC Plus**

I have made attempts to get satisfaction from Time Computers, both through the local manager and the company direct. The local manager has been as helpful as he could but even he cannot get reasonable contact with people at his head office.

The problem is that on 8 September when I booted my computer, I had the enclosed message on my screen.

Some three days after the warranty ran out I noticed that I did not have a copy of the Windows 98 CD, which should have been supplied with the computer. This was at a cost in excess of £1250, which I had set up on a single payment standing order, through my bank. Despite this, I received a letter from them setting up a payment system even though they had been paid, as confirmed by my bank. This was later agreed that it had gone to a wrong department.

Time computer company refused to supply me with a disc, stating that I should have asked for it sooner, though I did point out to them that I would not have asked for a second one as it would have been superfluous. There was a series of letters and phone calls regarding this but they were adamant that I would not get one. I now know why that was as it is shown on the printout from the machine, a copy of which is enclosed.

I feel that there has been a grave injustice here as I paid for an up-to-date and complete copy, not a preloaded, pre-release version. I also feel that I should now be given an up-to-date version of Windows 98SE in recompense for all this upset.

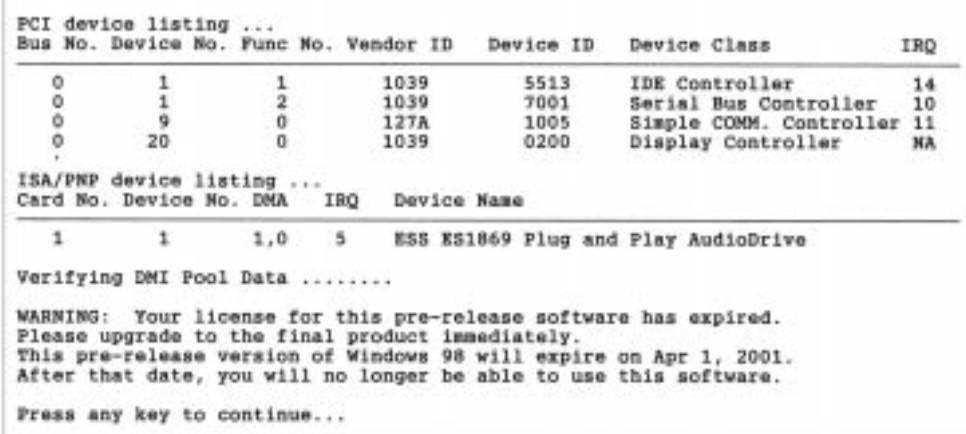
A.S. Gravestock

OUR REPLY: At the time of writing, we had contacted Time, who promised to look into Mr Gravestock's complaint, but had received no answer. We'll keep you posted on this interesting story.

Now and Zen

Dear **PC Plus**

I am writing to complain about an advertisement on page 3 of your November 2000 issue, for Zen Internet. Clearly it is designed to mimic one of your own reviews, and it does this very effectively - only one or two subtle clues indicate that this is an advert not a



↑ The message received by Mr. Gravestock telling him his licence for Windows 98 had expired

genuine **PC Plus** review. I believe it is irresponsible to allow this to be published without making it much clearer that it's an advert and not your magazine's opinion. According to your Promise To Your Readers: "Our Reviews are renowned for their independence, accuracy and thoroughness... When you read a **PC Plus** review, you can buy safe in the knowledge that the product will do exactly what you want."

Surely allowing heavily disguised, mock reviews to be published undermines this trust in the magazine you are establishing. I am surprised you allowed them to use your design; presumably this is copyrighted in some way also.

Keith Wallace

OUR REPLY: We couldn't agree more. All magazines occasionally carry advertising features, but these should always be clearly marked as such and certainly should not be trying to fool the reader into thinking it is a genuine review. Also, we would never agree to situate such an advertisement at the very start of the magazine. Zen was very late in supplying its advertisement to us for the November issue and was given special permission to send it directly to our printers, thus bypassing the usual checks. Zen abused our trust and abused the intelligence of **PC Plus** readers - we are currently considering what action to take in regard to this shameful opportunism.

Dis-Connect 25

Dear **PC Plus**

I have been reading **PC Plus** for many years and I am still impressed with the content and the quality of the **Superdiscs**. Praise aside, I noticed in your recent publication of **PC Plus** that you ran an advertisement for Connect25. This company are offering Internet access 24 hours a day, seven days a week for an annual payment of £25. This sounds too good to be true. I visited the Web site expecting details of phone numbers and online registration. Connect25 require you to print an order form and send a cheque or cash in the post. I then looked up the online telephone directory on BTInternet for the mailing address quoted, but no number was found. Is this a bogus company you have allowed to advertise in your magazine, or am I being over paranoid resulting from the recent article you ran on purchasing over the Net? I do not want to send £25 to receive an installation disc, which will never arrive because this is a Net scam. If there are any satisfied customers using Connect25 I would be happy to hear their comments.

David McCarthy

Dear **PC Plus**

On page 97, **PC Plus** 169; you are running a half page advertisement for Connect25. I have noticed many different articles about unmetred access over the past few months but I don't recall having seen you mention this one. I have had a look at their Web site and read through their terms and conditions and I am frankly quite baffled. The Web site gives you the

impression that you would have to be greedy, or stupid, to expect something for nothing. The terms and conditions seem to suggest that you are entering a lottery where the ticket price is £25. What really is the score as I assume you would not allow someone to advertise if it was not completely above board?

Julian Spicer

Dear **PC Plus**

Could you please advise whom I contact in the magazine to complain about the Connect25 advert. I replied to the one in the Autumn issue and they have cashed the £25 without any service. They are still advertising in the October issue. Your readers of similar naivety to myself need to be warned and you should attend to their advertising.

A.G.Turner

OUR REPLY: We attempted to contact Connect 25 but they did not reply to our messages. Imagine our surprise, then, when we received the following e-mail from Mr Turner:

Dear **PC Plus**

Regarding your kind response to my e-mail, I heard from them this morning giving a connect date subject to the return of their company rules signed. Was this your intervention one has to wonder. I have been trying for a month to contact them and really was wondering if it was a set up for idiots like me trying to get free Internet. I should say that I use both Breathe and RedHotAnt free services and have not had any trouble. Breathe is very good - never once unable to connect. You might well question why I want yet another. Connect25 claim to approve applications in 14 days (Web site claim) and one should allow some leeway but they cashed the cheque mid-August and then disappeared. If it was your help then thanks very much. Sorry to bother you with it. I am, have been and will continue to be a subscriber to **PC Plus** which I consider the best of the bunch. The layout and articles are all excellent.

A.G.Turner

OUR REPLY: To be absolutely honest, it's hard to say whether this is down to our intervention. We attempted to make contact with Connect 25 about the case but had no reply as this issue went to press. Our sources provisionally confirm that the company simply under-estimated the response to its advertisement. A helpline number should have appeared on its Web site (www.connect25.co.uk) by the time you read this.

Time not on Me side

Dear **PC Plus**

It may interest some people that when Windows Me OEM is bundled with a PC, Microsoft has apparently banned manufacturers from including the installation CD with it.

From what I can understand from Time Computers, the WinMe installation (as a Norton Ghost image) is stored on a hidden partition on the hard drive. The only way of accessing this partition is to purchase a Time branded CD cosing (£50) which is able to access this package and allow you to revert back to the original disk image, containing WinMe.

This makes it difficult to dual-boot with Linux, which seems anti-competitive to me. It also means that you cannot upgrade to a larger hard drive.

Am I the only person to find this totally unacceptable?

Phil

OUR REPLY: We contacted Time Computers about Phil's complaint. Time's Gary Bramwell said: "The cost is £20 not £50. This does not prevent the customer from putting Linux dual-mode on his system." Simon Williams tackles this worrying problem in our PC lab test, starting on page 40.

Cheep Linux

Dear **PC Plus**

I am having trouble with one of your advertisers. Back in May I ordered six, plus one free, Linux CDs from www.cheeplinux.com. They took the amount of £32.93 from my credit card account and sent 4 of the CDs, stating that the others were to follow. I have since sent two e-mails but heard nothing. Can you please do something about this or advise me what I can do next?

B H Gagg

OUR REPLY: We contacted Cheep Linux on Mr Gagg's behalf and got the following response:

"Thank you for bringing this matter to my attention. I have checked our e-mail system and can find no record of any e-mail correspondence with Mr Gagg. However I have checked his order and it would appear that it had been accidentally mis-filed as a completed order by somebody who no longer works for the company. I have rectified the mistake today and offered Mr Gagg some extra free CDs by way of compensation.

"We ship hundreds of orders every week to satisfied customers and have had glowing reports for our quickness of service and attention to detail. We stock virtually every Linux distribution as well as compilation CDs and aim to ship orders as quickly as possible, usually the same day, if necessary part-shipping an order and completing it as soon as possible.

"The promotions that we undertake in **PC Plus**, together with those undertaken in other **Future Publishing** magazines, are fantastically successful, generating very large volumes of requests for the free Linux CD-ROMs, so it is not surprising that the odd one may get sent out incorrectly.

"We have had the occasional order lost by Royal Mail, and have sent out the wrong discs a couple of times, this is the

only complaint we've ever had caused by mis-filing.

"We deal with complaints promptly and recompense errors or omissions.

"We have recently had a new telephone system installed and changed numbers. Customers can contact us on 0870 7406575 or e-mail sales@cheeplinux.com.

Brian Teeman

www.cheeplinux.com/pcplus"

Write in

E-mail: campaign@pcplusmag.co.uk

Write: Campaign, PC Plus,
30 Monmouth Street,
Bath BA1 2BW

Fax: 01225 732295

→ The good guys

LG Studioworks replace faulty goods



↑ **LG Studioworks promptly replaced the faulty monitor**

Dear **PC Plus**

I often read in different PC publications about bad service but rarely do we read about the good. I would like to tell you about a monitor I bought from a well known stationer and PC supplier.

I purchased the said monitor, a 17-inch LG Studioworks 74m, two years ago last June which, by the end of July, packed up on me. I contacted the supplier who informed me that as I never took out its extended guarantee, the original twelve month warranty had passed and therefore they could do nothing. When I asked them for the manufacturers contact number, I was told they couldn't find it and if I was able to contact the manufacturer, it would cost me a minimum of £60 call out fee plus any other charges and would still probably have to pay for a new monitor.

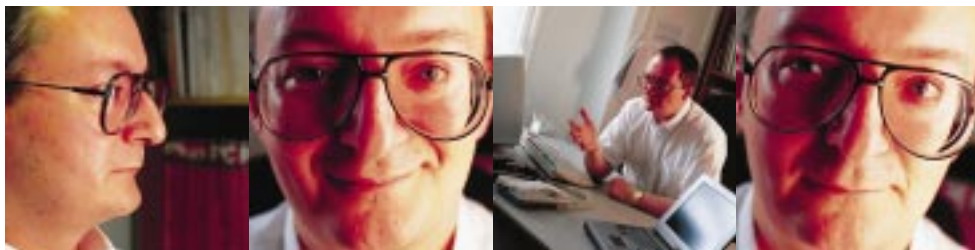
Having bought my other PC components from another company when I constructed my machine, I telephoned them and asked if they knew of a monitor repair company locally, they told me to contact the manufacturer as there should be a three year warranty on all monitors.

Taking a leaf out of Huw Collingbourne's book, I again telephoned the company that supplied the monitor and asked to speak to the manager, whereupon I was asked in what connection. I told the assistant that I needed to speak urgently to the LG technical staff. After a few minutes wait I was given a contact number. On 4 August at about 5pm I explained my predicament and was told to expect a replacement within two weeks.

Four days later however a courier delivered a replacement monitor and took away the old. Now that is what I would say is a really good back up service and my thanks go to LG Electronics.

Patrick Bevan

REFLECTIONS



Dave Pearman

Windows Me is the latest consumer OS, but is Microsoft fixing old problems and causing new ones? Yes, and no, says Dave Pearman...

Microsoft continues with its string of Windows 9-and-a-bit operating system releases with Windows ME (Millennium Edition). When you see how the company annoyingly capitalises the product as Windows ME, presumably to give it a cutesy, cuddly feel to consumers, you just know there's going to be trouble ahead, don't you? And sure enough... there is.

First of all, consider the purpose of Windows ME (I'm sorry – I absolutely refuse to succumb to Microsoft's abhorrent abuse of the conventions of written English here). It's meant to be the ultimate OS for consumers, in other words non-enthusiasts, isn't it? The great unwashed want a system that doesn't crash all the time, doesn't break whenever they have the temerity to install an application, plays games at full speed, and includes a bit of MP3 and movie creation, apparently. And if that's what these people want, ME mostly gives it to them.

That might sound like damning with faint praise, but there are one or two changes in ME that I thoroughly approve of. System File Protection prevents naughty applications from overwriting Microsoft's own files as they install, ending the ridiculous situation where every installation of Windows out there is different, as more and more key system files get replaced with a software publisher's own idea of an improvement. It's a support nightmare, and one of the main reasons why people have to keep re-installing Windows (more on this later). Ever wondered why every other program you install insists you re-start Windows? It's because the installer can't update files that are in use at the time – usually

because they're part of Windows itself. It's about time this practice was stopped. At least now it's the new application that breaks, not the operating system.

Oh, and one or two of the new bundled applets are worth having, particularly Movie Maker, though where this sits in the greater scheme of things since the DoJ victory is uncertain. Having seen off all the disc compression vendors, and established the only viable price for a Web browser as \$0, which application is Microsoft going to go after next?

“Having seen off all the disc compression vendors, which applications is Microsoft going to go after next?”

I'm sorry, but for me (not ME, or even Me) it's all downhill from here. In an attempt to make Windows even more user-proof, Microsoft has seemingly removed support for Real Mode DOS. This isn't true, of course – it's just hidden – as ME is still built on the same 'skin on yesterday's rice pudding' architecture as all 9x versions.

While it's easy to see why the company doesn't want users mucking about with dangerous command line activities, it's less clear why breaking many anti-virus products, and preventing you from upgrading your PC's BIOS are improvements. Predictably, third parties have stepped into the breach and offered little utilities that restore all of the lost functionality. Check out Shell Extension City at <http://shellcity.net> for more details.

In much the same way, changes to the TCP/IP sub-system break personal firewalls and other security products where numerous changes under the hood cause problems with some of the other applications. One of the first questions our disc support team asks now when a reader says a coverdisc program doesn't work is “Are you using Windows ME?”.

On the positive side, it might be a cheap upgrade if you're using Win98, as there's a 'Limited time' upgrade price of £40. Putting aside the usual “Why should I pay for Microsoft to fix things it broke in the first place?” questions, you might wonder whether it's worth even this for the bits of ME that you can't download from the Web. If you're using Win95, the cost goes way up, as you're penalised for not upgrading to Win98 when you were told to. What were you thinking of?

My final, and probably most telling criticism of Windows ME is to do with the way it's apparently going to be bundled with PCs. No, I don't object to it being included at all, as it's worth having for 'free', and a new PC will at least have ME drivers for all the components inside (hah!). What I really do object to is the likelihood that you won't get a CD with Windows ME on it at all – just an installed copy, and possibly a locked image somewhere on your hard drive.

I can't stress strongly enough that this is a bad thing, as does Simon Williams in this month's PC group test. What do you do when you upgrade your hard drive? Or when (not if) your existing one gets trashed? If this is an anti-piracy measure, and the copy of Windows is linked to your PC's unique identity, what happens when you replace your motherboard or processor? Already, I hear of at least one vendor that is planning to charge you £50 for a disc to unlock the version of Windows you thought you'd already paid for...

I can't help but think that Microsoft has really lost the plot on this one, and seem intent on alienating the very customers that put the company where it is today. Personally, I wouldn't buy a PC like this any more than I'd buy a new car with the engine compartment locked, and the dealer holding the only key. **PCP**

Write in!

What do you think?

Write to **PCPlus** mailbox@futurenet.co.uk, or to Dave at dave.pearman@futurenet.co.uk



Martin Banks

Is e-business all it's cracked up to be? Martin Banks reckons it's just extra grief for the harrassed consumer

I suppose your argument was logical in purely commercial terms, but I no longer think of the Internet as a business tool." That was the opening gambit in a recent e-mail.

The sender, was taking exception to my observations in a recent column about the opportunities that exist for small businesses and the self-employed to lead in the exploitation of the Internet for business purposes. While it would be easy to start an argument with him of the is/isn't possible variety, his comments raise other issues that are important in a wider context – if there are business opportunities to be had with the Internet, where in practice can they be found?

People may well have back-pedalled on thoughts of setting up an e-business after seeing the debacle of the DotComs this year. At face value that is obviously sad, especially as the UK Government is trying to push e-business as the future, and is well aware that we seem to be lagging behind in our 'DotComness' rating. Even the Germans, evidence seems to show, are more in tune with e-business development than we are.

But, as Mark (the sender) points out, the DotComs seemed to misunderstand the nature of the Net, and its users: "I was taken in by shopping online and all that claptrap," he writes, "but it didn't take me long to realise that the real fun was to be had in chat rooms, on Usenet, and engaging in other online activities that are worthless in monetary terms."

The DotCom explosion of the last couple of years has, arguably, been built on the vain hopes and dreams of the servants of Mammon, without real evidence that a sustainable business model exists – or exists yet. There were a huge number of 'successful' DotComs,

but their primary success was in raising money from the greatest servants of Mammon, the Venture Capitalists. It has been said that they have created a new business opportunity based on hope, and only afterwards do they seem to have asked simple questions such as 'is this business making, or in danger of making, a profit?'

"Even the Germans, evidence seems to show, are more in tune with e-business development than we are"

The answer is that the majority have not made a penny. Indeed, they have spent billions for naught in the way of achievement. Why? Maybe Mark has the answer: "Internet users are only briefly interested in the things the providers want them to be interested in – the things that generate sales. These are the familiar things, an extension of our real lives, but soon we realise that most of the best things (about the Net) are free."

"I no longer believe in e-commerce revolution. Sure I buy software over the Net, but records and books? I'll stick to the library. The trouble is, e-commerce is no more than technological mail order, while some of the best things (about the Internet) are like nothing available offline."

Now ain't that the truth? Like Mark, I find myself fascinated by the social, community-related aspects of the Internet, the coming together of people with common interests, but often extremely different backgrounds. As Mark says, "There's absolutely no money to be made from that. It's priceless!"

Many companies have viewed the Internet simply as a way of making their business lives easier while not having any clear idea of what they are actually offering potential customers. Yes, I can order a Mongolian Nose Flute direct from the manufacturer, but what are the problems of getting it to England? I waited three months for one book from America (they had the money out of my

credit card quickly enough), so I am fairly jaundiced about the reality of e-business already. It made the 'sale' very easy and cheap for them, but the hassle and frustration greater for me.

If many of the DotCom companies have missed the point of e-business, does that mean e-business is, ipso facto, a non-starter? The answer is, I feel, a resounding 'no', but it does mean that we will need to look at doing business in a new way. I suspect that the notion of the 'corporation' may be doomed, long term.

If the Net is great at communicating ideas around 'communities of interest', then it may well be that what was a rigid 'corporation', may transmute into a 'loose association for a particular purpose', be that purpose building houses or happiness. Individuals will have individual roles within such communities, contributing what they have to offer, and getting in return whatever they feel is appropriate. In other words, 'e-business' may be the way in which individuals link together to create, manage and fulfil a business opportunity in the same way that they fulfil a discussion opportunity. Everyone could well be self-employed.

Is that too far-fetched? It probably is, but the evidence so far shows that, while traditional (and not so traditional) businesses have failed to extend their business models to the Internet with any serious degree of success (and some seriously burned fingers along the way), it's growth as a function of 'community' has grown exponentially.

There may not be money in the chat rooms and Usenet for businesses rooted in traditional business models, but there is every chance of new opportunities coming through them, and in favour of the individuals in attendance. **PCP**

Write in!

What do you think?
Do you share the same views as Martin?
Write to us at **PCPlus.mailbox@futurenet.co.uk** or **banksie@cix.compulink.co.uk**



ChrisBidmead

A free, disposable barcode reader has limited news value in the UK. Why is Chris harping on about the CueCat again this month...?

Digital Convergence describe the CueCat as “the biggest computer innovation since the mouse”. It’s certainly not that exciting. The CueCat saga seems to be turning into a Parable for Our Time as the lawyers and developers pile in on opposite sides and tussle over who is entitled to do what with. The CueCat users feel that as they’ve been handed a freebie they should be able to do what they want with it. The lawyers are evoking the small print, which says the thing is on loan and is subject to a string of restrictions.

These petty squabbles exemplify what threatens to be the next big issue in the future of computing. When I first started writing this column at the beginning of the 90s, the key to the future appeared to lie in the technology itself – who had the most capable hardware, the smartest software. But by the mid-90s – call it ‘phase two’ – we were beginning to see hardware as just another commodity. For many people software was coming to resemble an ‘essential resource’, destined to be freely available. On this theory, much more important was the issue of how you use it to do the things you do. That, as the trade jargon has it, would be where the ‘value-added’ lay for the future.

Phase three isn’t turning out that way. We could be exploring and exploiting the New World opened up by sharing ideas and products, begetting a cornucopia of new ideas and products. Instead, we seem to be dickering about the rights and ownership of our limited achievements to date. We have the Motion Picture Association of America attempting to gag software designed to play DVDs on systems they don’t control. And now there

is the notorious Napster case, in which the Recording Industry Association of America is attempting to shut the stable door after the horses have bolted, foaled and are happily populating pastures new.

Only in America! Well, alas, no. Over here the European Union’s Patent legislators are gearing up to follow the daft, decade-old US practice of allowing patents in software. Software patents are a sure fire way to stifle innovation, no company with anything less than a battalion of lawyers will dare commit new ideas to code for fear that somebody has got to the Patent Office first. Last month I mentioned the 145 lawyers listed on the letterhead of the ‘Cease and Desist’ missive received by one CueCat free software developer, Michael Rothwell. In future, anyone who writes any software, free or proprietary, may be at risk of the same kind of intimidation.

David Mathews, Digital Convergence’s VP of new technology, was gungho about

“No company with less than a battalion of lawyers will commit ideas for fear that somebody has got to the Patent Office first”

the heavy legal artillery manoeuvring against Rothwell and others who had dared to publish code for and information about the CueCat. “We had to make a bold statement up front that we didn’t authorise you to do this,” Mathews was reported as saying in an interview with journalist Kevin Poulsen for the SecurityFocus.com Web site (www.securityfocus.com/news/89). “We encrypted our Cat data, and you’re not allowed to take over that output”.

This statement was the closest Digital Convergence had come to revealing in what way they thought Rothwell and others might be “in conflict with intellectual property rights” owned by the company. The lawyers had kept things vague; Mathews is not a lawyer, and his statement is legal gobbledegook. Striking a note of apocalyptic desperation he

went on to say: “If people take over our Cat and start using their own databases, the world becomes cloudy. Our revenue model is being the gate keeper between codes and their destinations online.”

The free software community laughed at this. US Federal Law says recipients are in no way bound to ‘agreements’ attached to unsolicited items delivered by post, which is how hundreds of thousands of CueCats had arrived in homes and offices subscribing to Wired and Forbes. Digital Convergence’s rickety ‘revenue model’ is failing, not because of illegal activities by Cat users, but because it’s based on the company’s ignorance of the law and sheer wishful thinking.

There was much wishful thinking behind Mathews’ declaration of victory to the hackers. “They pulled the code from their sites,” he crowed, extrapolating prematurely from his temporary victory over Rothwell, who, as I reported last month, decided to play safe and withdraw his program from public view as he couldn’t afford legal counsel. “It was a very swift, very quick shutdown.”

An odd definition of ‘shutdown’. Since last month there has been an outbreak of unofficial CueCat Web sites. Many include code that makes the CueCat useful without the dubious assistance of Digital Convergence’s ‘gatekeeper’ site, and some have engineering breakdowns of the hardware. A useful starting point is <http://s1066194.umsi.edu/cuecrap>

Digital Convergence boasts that “the company’s management team includes a roster of industry veterans from Time Warner, AT&T, GE, ING Barings and Disney”. If the CueCat case really is exemplary of future trends, the joke seems to be on them. **PCP**

Write in!

Do you agree with Chris’ views?

Write and let us know at

PCPlus.mailbox@futurenet.co.uk or to Chris at bidmead@cix.co.uk

the complete guide to **DIGITAL PHOTOGRAPHY**



Why digital?

Digital cameras give you instant pictures that you can print or e-mail. Adele Dyer tells you all you need to know about digital photography from the kit you need to the right software

Digital cameras are still thought of by many as rather self-indulgent gadgets that are far inferior to film cameras, and in some ways they are. But they are also extremely useful, giving you instant pictures that you can print or e-mail, without film stock and developing costs.

Film and digital cameras are very similar in many ways. Both depend on a lens to focus light on to a light sensitive medium and in most cases each will have plenty of electronics packed into the body to deal with such things as automatic exposure and flash modes. However there are some blatant differences: analogue cameras record on to film and digital cameras take the output of a CCD and record it to memory.

And therein lies the very crux of the matter. Silver halide film has a far greater resolving power and because of its makeup of irregularly dispersed crystals it will never

appear as a series of aligned dots, as digital photos can. Add to this the fact that digital cameras suffer from noise, eat power for breakfast and use expensive memory cards and you start to wonder why you would want to make the swap.

Of course, digital wins over film for sheer speed and convenience. Most of the national daily press has now gone over to digital for the simply reason that the picture editors can get the latest pictures on to the pages in a much faster time. And it is the same for you and we – no more waiting for your prints. Even sending photos to family and friends is speeded up. You can print extra copies on your ink-jet or simply e-mail them the original photo and let them do the printing.

For those of us that like to manipulate our photos, we do not have to waste time scanning the photographs and or lose quality in the scanning process.





→ What do you need?

You need to make sure you get the right kit for the right job

For immediate e-mailing – You need a camera with a low resolution. No one will thank you for being forced to download huge files.

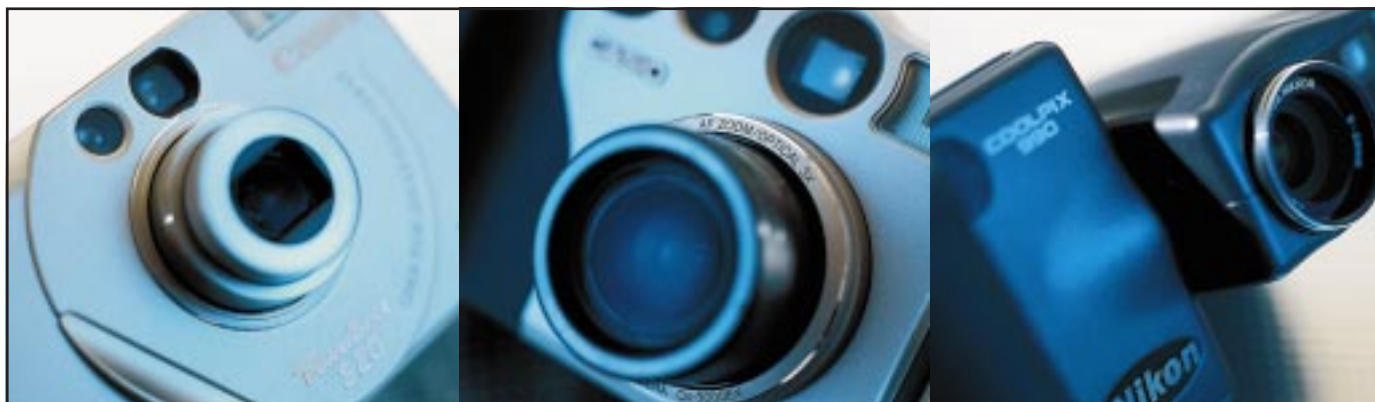
For the Web – Either a low resolution camera, or a mid-range camera where the size of the image can be reduced when you manipulate the image.

For reference – A mid-range camera. If all you need to see are certain details on an object, say for insurance purposes, a one

megapixel camera may suit your needs.

For printed catalogues – Depending on how large you want the images to be, a two megapixel camera will probably provide the best compromise between image size and resolution.

For perfect colour prints – A camera with the largest resolution you can lay your hands on. But don't forget to look at the quality of the CCD and the features it offers.



What to look for

While the quality of digital camera images may not be as fine as those of film, the cameras themselves are starting to offer far more scope to those photography enthusiasts who are making their first forays into digital photography

What you look for in a camera will depend very much on the kind of photographer you are and how you intend to use the images produced. For example if you are a keen photographer you may want all the bells and whistles possible, but if you only want snaps to illustrate your Web site or to e-mail to friends and family then you will want a very simple camera with a low resolution.

Assuming you are the kind of photographer that likes to play with f-stops and shutter speeds to take shots in a difficult lighting conditions or to play with depth of field, then you will want all the image adjustment features you can lay your hands on. After all, image manipulation on the PC can only go a certain way to correcting bad images. Much better get them right the first time around.

So you should look out for aperture priority and shutter priority to control the exposure. While these functions are controlled in software rather than being physical settings as on a film camera, they do nonetheless allow you to mimic some of the effects you might achieve on a film camera.

Again, on the exposure side, you can try to look for a camera that mimics ISO ratings. ISO figures are always quoted on silver halide film, for example ISO 100 or ISO 400. The lower the figure, the more light it requires to take the image. So ISO 100 is fine for bright, sunny days, while ISO 400 will deal better with gloomy days. Obviously the CCD will only be able to mimic this artificially, but higher end cameras can offer the equivalent of ISO 100, 200 and 400 on their cameras. Some caution is advised when playing with these settings, however, as they can make the picture look grainy or introduce noise to the image.

Next look for a camera with a white balance control. This, as the name implies, allows you some control over the level at which your camera shoots white. The camera will then use this level to judge the other colours it will be shooting. In some cases your camera will have presets to deal with certain lighting conditions, such as sunlight, fluorescent or tungsten light. Better cameras will provide a sliding scale for white balance while the best ones will enable you to set a reference white which can then be used for the length of that session. The same effects can only be achieved with filters on the film camera.

And so to the flash modes. Almost all digital cameras have flash settings for forced flash, no flash, automatic flash

where the camera decides on when the flash is needed, and red-eye reduction flash. However there are occasions when you will want to reduce or increase the level of light created by the flash, so look for flash stop-downs to reduce the level of flash.

Finally among the features take a good hard look at the macro mode. All digital cameras have this feature, but they all vary greatly in the kind of facility this offers. Find out how close the camera can get to the subject. This can be anywhere between around five and 20cm. Also find out whether the camera takes its macro shots with the zoom or with a wide angle, which again will determine how close in you can get to the subject.

Speaking of zooms, the lens is perhaps the one feature that most users will settle on before any other. Digital camera lenses cannot be compared truly to film camera lenses, of course, as they are far smaller closer to the CCD. However, manufacturers make life easy by speaking in terms of equivalence to 35mm film camera lenses. A fixed focal length lens on a digital camera will usually be the equivalent to a 50mm lens on a film camera. However most digital cameras offer zoom lenses, which can offer magnification up to around three times, roughly translating as a 35 to 100mm lens. Few cameras come with as wide angle a lens as a 28mm lens.

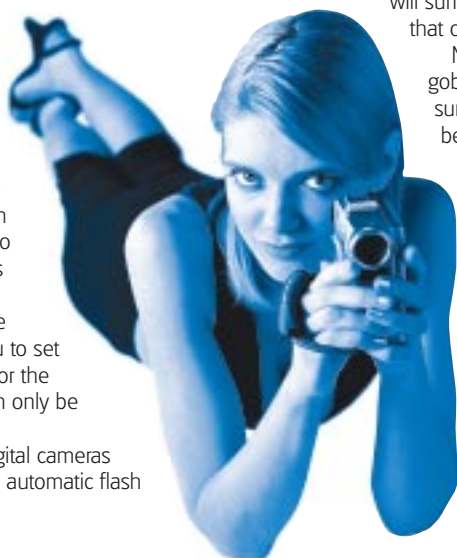
Some cameras will allow you to add extra lenses on to the camera, but these can be expensive and hard to source as they tend to be made specifically for certain cameras. Very high end digital cameras, that is cameras used by professionals, may be able to take standard SLR lenses.

Many cameras will also quote you a digital zoom value. Ignore it completely. Digital zoom is fake as it is simply a part of the complete image. Digital zoom is achieved by taking just the centre of the picture as the whole image, reducing the size of the image. After all why let the camera crop the image when you can do a better job in software?

Of course, one thing you cannot do with a digital camera lens is look directly through it, as on an SLR (single lens reflex) camera, as it is so close to the CCD. However you can do the next best thing and look through the LCD, which provides the same view that the CCD has. The viewfinder, by contrast, will be placed at a distance from the lens and so will not have the same view at all. In fact, in many cases viewfinders will suffer from 'parallax', that is a view that is slightly to one side of that of the lens.

Not that LCDs are perfect. Apart from the fact that they gobble up power, they can also be very difficult to see in sunshine, especially when the sun is behind you as it should be to take the best shots. Some cameras are now fitted with light slots that let daylight in behind the LCD, although in practice these can sometimes be counter-productive.

However good the camera lens, it would be as nothing without a good quality CCD. With a wide dynamic range, the CCD is able to pick up a wide range of colours and adapt to a wide number of different light conditions. Funnily enough the actual resolution of the CCD will not affect the outcome as much as you may think. A CCD with a resolution of, say, 800 x 600 might actually produce a better quality image than a camera with a resolution of 1,024 x 768 if the CCD is better. Remember that you cannot recreate in software detail that you have not captured and so it makes sense to



go for a camera that is sensitive to nuances in order to get the best reproduction of the image.

The resolution will govern the size at which the image can be printed out, however. Your images are effectively a series of dots, or pixels. Relate that to the dots produced by your ink-jet printer, then you can work out how large the image can be printed. So if you are going to print out a 1,200 x 1,024 image at 300dpi, then you will end up with an image 4 inches by 3.41 inches. We will come back to printing later on.

While we are talking about resolutions, a quick word about effective resolution. You will often see CCDs referred to as having so many million pixels, say 3.3 million pixels or megapixels, with an effective resolution of around 2,160 x 1,440. Do the sums and you soon find that this is about 0.2 million pixels less than the actual number of pixels in the CCD. So what happens to the rest?

There is a band of pixels around the edge of the CCD which do not take part of the image. Generally they are coated black and so do not actually take an image at all, but rather measure zero light against which the colours can be judged.

Finally, do not be fooled into thinking that your camera has a higher resolution than it actually has by looking at interpolated resolution. Interpolation merely adds pixels in software, which might work well for smoothing edges, but is not a replacement for capturing pixels in the first place. After all, no amount of fiddling about in software is going to add details that were not caught by the CCD.

We discuss how CCDs work in more detail in the box on page 94. Suffice it here to say that they generate a huge amount of information that has to be processed to create a usable image. Of course the larger the CCD, the more information is created and so the larger the memory that is needed to store it.

In order to fit images into a reasonable amount of memory, the camera normally compresses the image. Usually JPEG compression is used and you can set the level of compression. Most cameras offer either two or three levels of JPEG compression and of course the higher the level of compression the more images you will be able to fit on your memory card.

Remember, however, that JPEG is a lossy compression algorithm and the more you compress an image, the more detail you will lose. Unforgivably JPEG can also introduce artefacts, that is pixels which emerge in the image that do not appear to have been part of the original image. Not all JPEG compression algorithms are created equal and each manufacturer will add their own tweaks to improve on the basic calculations. However some work better than others and a bad algorithm will cause more problems than it solves.

There are two ways to side-step these problems. The first is to look for a camera that can save your images as raw TIFFs. This file format does not compress the image at all, so you are going to need an awful lot of memory to save the image. For example, an image that is 1,000 x 1,000 pixels in size will give a file size of 2.86MB. Since many cameras only come with an 8MB card, you can see that you are quickly going to run out of space.

If your camera does not offer raw TIFFs, then use the lowest level of compression. Your camera will doubtless refer to this not by the level of compression but by the quality of the image you will get out at the end. So you will probably see a setting such as 'best' or 'high'. Again, however, you had better have stocked up on memory.

How much memory you need depends very much on how you are going to use the camera. If you are only going to take a few shots and then go back to your PC, or if you only ever intend to shoot 640 x 480 images, you may need only a small amount of memory. However if you intend to shoot high quality images for printing and you want to take a large number of images at one time, such as when you go on holiday, then you had better save your pennies for a couple of high capacity memory cards.

There are basically two types of memory in your camera: internal and external. Even if your camera does not store the image on the internal memory, it uses it as a buffer while processing the data that goes to make up the image. You will most need to know about the external, removable memory, however, as in the vast majority of cases this is where your shots will be stored.

Removable memory either comes as CompactFlash or SmartMedia cards. CompactFlash cards are increasingly the more common type of card used. The cards are born out of the PCMCIA standard and look a little like a shrunk down PC card. They are about a quarter of the size of a floppy disk and slightly thinner than a Type II PC card. They have a series of connectors along one side as you would find on a PC card.

→ Glossary

ADC –	Analogue to Digital Converter. This takes the analogue output from the CCD and turns it into digital values that can be manipulated by the DSP.
Aperture –	On a film camera this is an adjustable diaphragm which controls the passage of light into the camera. Works with shutter speed to determine depth of field.
Artifacts –	Distortions of the image, often caused either by noise or by heavy handed compression.
CCD –	Charged Couple Device. Plays the part of film in registering the image seen through the lens. See box on how digital cameras work.
CompactFlash –	A removable memory type used to record digital images.
Digital zoom –	Not a zoom at all, digital zoom simply crops your image to display just the central portion of the image.
DSP –	Digital Signal Processor. Processes the raw data before the image is stored on the memory card.
Effective pixels –	The number of pixels of the CCD used to make up the final image.
Interpolation –	A software algorithm that will add pixels, but not detail.
ISO –	International Standards Organisation. Denotes the light sensitivity or speed of film.
JPEG –	Joint Photographic Experts Group. A lossy compression technique which can normally be set to different levels on the camera, but which will lose data and can introduce artifacts.
Noise –	Grain or random colour pattern on what should be a continuous tone.
Optical Zoom –	The true measure of the focal length of the lens.
Resolution –	The size in pixels of the image.
Shutter speed –	The time the shutter of a film camera is open. Often mimicked by the electronics of a digital camera, although some cameras are now fitted with physical shutters.
SmartMedia –	A removable memory type used to record digital images.
TIFF –	Tagged image file format. A widely supported format that does not compress images.
White balance –	Colour correction to deal with various lighting conditions.

→ Serious software

Which packages are best for tweaking your digital images?

There is an amazing range of software for manipulating your photographs on PC. Perhaps the best known is Photoshop from Adobe (www.adobe.co.uk). This has been the best photo-editing package for many years and its dominance looks set to continue for the foreseeable future. Its power and versatility comes at a wallet crippling price, however, and many people will be better off with one of the mid-range

alternatives. Paint Shop Pro (www.digitalworkshop.co.uk) and MGI PhotoSuite 4 (www.mgisoft.com) are the leading contenders here. You can download a trial version of PSP from the Digital Workshop site. Finally, for unadulterated childish fun, it's hard to beat Kai's Super Goo (www.jungle.com). This budget package lets you distort, warp and enlarge any bit of a photograph – caricature of my mother-in-law, anyone?

→ How does it work?

So what's the difference between a film camera and a digital camera? We reveal all...

Digital cameras are essentially the same as film cameras. Light passes through a lens which focuses it onto a medium that will react to that light. The difference in digital cameras, of course, is that the medium, the CCD, is very different to film and can only produce electrical charges that will have to be processed and stored before they can be used by the photographer.

Digital camera lenses are much smaller than lenses on ordinary film cameras as the area they have to focus on, that is the CCD, is also much smaller. However, to help out us confused end users manufacturers will still refer to their lenses in terms of equivalence to lenses on 35mm cameras.

The light that passes through the camera is aimed on to the CCD (charged couple device). The CCD is made up of a series of light sensitive cells, known either as photosites or photodiodes, arranged in a grid. High end digital

cameras now have CCDs with around 3.3 million pixels (3.3 megapixels) all on a 1/1.8inch CCD. These photosites are set into action when light falls on them and produce negatively charged electrons. The greater the intensity of light, the higher the charge.

As CCDs are monochrome devices, layers of dye are added to the CCD. The dye is usually made up of three colours, red, green and blue. There are twice as many pixels painted green as red or blue as the human eye is more sensitive to green. However some CCDs are coated with cyan, magenta, yellow and green dyes.

The charge from each photosite is transferred to an electrical contact under the photosite before being passed on to a read-out register. Each row of the CCD is read in turn. As the first charge in the row is read off into the register, its cell is cleared and the charge from the cell behind it is transferred to the first cell. So the charge from each



cells back up the length of the row is also pulled forward to the next cell in the line.

The charge from each cell is then passed to an ADC (analogue to digital converter) which takes the charge from each cell and translates it into a digital value. The image data is then passed to the DSP (digital signal processor) which will process the data, possibly carrying out the JPEG compression you have set,

and maybe even interpolating the image.

Finally the data will be passed to the memory where it will be stored, ready for you to use again.

The entire process used to take several seconds and you were prevented from taking another picture until the first had been saved to disk. Luckily digital camera manufacturers are now working hard at reducing that delay.

SmartMedia by contrast are wafer thin cards with their connectors exposed which makes them far more susceptible to damage than the more robust CompactFlash cards.

If you have set your heart on a particular camera, then you have to put up with whatever memory type the manufacturer has chosen. But if you are more of a floating voter then look at memory costs before you leap. SmartMedia currently comes in configurations up to 64MB and the largest cards cost around £130. CompactFlash meanwhile can be bought in much larger configurations, with 128MB cards now available, which cost around £250. A 16MB SmartMedia card will set you back around £26, compared to £35 for CompactFlash.

You should also think about whether or not you will want a reader for your cards, or whether you are going to download them directly from the camera itself. Readers are available for both types of memory in various forms. Many of them connect via the USB port and your camera can also doubtless be connected via USB, it might not be worth your while to opt for one of these. However CompactFlash cards can be put into PC Cards for insertion into a notebook and SmartMedia can be fitted into a floppy disk adaptor if you do not have USB.

Another hidden extra might come in the way of power. In most cases cameras are supplied with a set of rechargeable NiMH AA size batteries. These should always be used in preference to standard AA batteries which give such terrible performance in cameras that many do not support the AAs. NiMH batteries perform reasonably well, and relatively slow to discharge, although you should take care about how you recharge them if you want them to last. Some high end cameras will opt for the most impressive form of battery, namely Lithium Ion.

If you are out with your camera for the whole day you may well end up running out of batteries before the end of the day. It therefore makes sense to get your hands on a second set of rechargables in these circumstances, the cost of which will vary depending on battery type your battery needs. Most cameras come with a recharger as standard, although some shamefully do not. And if you want to run your camera off the mains when taking indoor shots or when downloading images you may well have to buy an AC adaptor as well.

Downloading, manipulating and storing

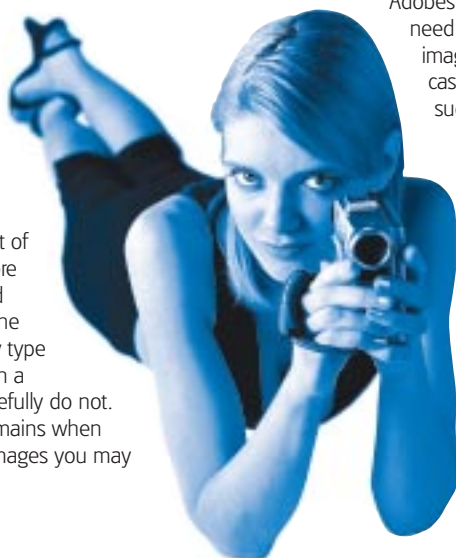
So once you've got your images you will want to get them on to your PC. Most digital cameras offer connections either via the serial or the USB port. USB offers far faster download speeds, which is very welcome when you are downloading a large amount of data. You may well also find an S-Video port on your camera for viewing images on a TV, or even a connection which will let you print directly to a small number of ink-jet printers.

Take a look at the protocol used for download. If your camera provides TWAIN drivers you can download your images directly to any TWAIN compliant software, a useful feature if you want to use your favourite image manipulation package. Unfortunately in many instances the software provided with the camera will only let you download to a certain software package that comes bundled with the camera. This can be a waste of time if you know you are going to be using a different package for the manipulation. It is also worth checking that any TWAIN drivers will work with the USB connection. On a few cameras the TWAIN drivers will only work with the serial link.

In some cases the camera will connect directly to the desktop using USB. The memory card in the camera will appear as a separate drive in My Computer or on the Mac desktop. You can then open the drive and transfer pictures to your hard drive just as you would from your floppy drive to your hard drive. You will probably be provided with some kind of image manipulation software. If you are lucky you will get a package like Adobe's PhotoDeluxe, which provides most of the features you will need to touch up your photos. However most of the provided image manipulation software is woefully inadequate, in which case it may be worth investing in a more complete package, such as Paint Shop Pro, which costs around £80.

Once you have touched up your images you will want to print them. As a general rule you can get away with printing digital photos on an ink-jet at fairly low resolutions. In some instances you can print as low as 150dpi, although what you can get away with will vary from print to print. Have several trial runs at each shot, working out the best resolution for printing. Obviously the lower the dpi, the larger the image will be, but it may occasionally be worth upping the dpi for a better image.

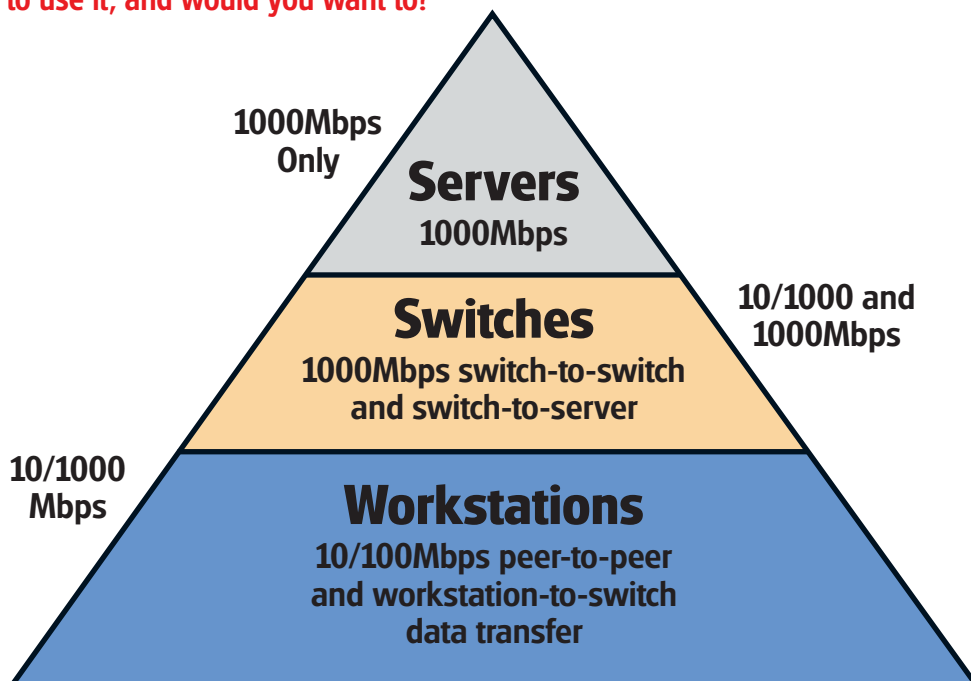
Finally, you will need to store your images. Hard disks are ridiculously easy to fill up and have been known to fail. So you may well want to consider a removable storage drive, such as a Zip, Jaz or CD-R drive to store your pictures permanently and safely. **PCP**



TECHNICAL BRIEFING

Giga-lution

Gigabit networking is here, and ready to roll – but are you ready to use it, and would you want to?



I have something of a healthy interest in operating systems. I take an interest in not only Windows, but Linux, UNIX, OS/2 and the MacOS. To that end, my home computers include a number of tortured PCs, and a single iMac.

The iMac is my machine that just 'keeps on running'. I tend not to fiddle with it, instead using it for Web browsing, e-mail, word processing and the like. Even if I wanted to tinker with it, thanks to Apple's closed computer philosophy, there isn't a great deal I could do. It came as something of a surprise, therefore, to find that Apple are suddenly leading the way in a field in which the vast majority of PC users are either completely lost in, or are simply ignoring.

Apple's lead showman, Steve Jobs, announced that (effective immediately) all new G4 Apple Macs would be shipping as standard with gigabit networking technology, which would also be available as an option on Apple's Cube. The iMac and iBook range would be left with the more usual 10/100Mbps system. Its reasons for this prompted me to think about who exactly gigabit ethernet is going to benefit and whether you or I should be interested. Before we can make any judgments, it's best to explain a little bit about what we're dealing with.

Here comes the science

What we now refer to as 'gigabit ethernet' stems from the IEEE 802.3 standard for adding a gigabit ethernet layer to 'regular' 10/100Mbps ethernet, specifically on

↑ In most situations, the bulk of network traffic is still going to be handled at 10/100 speeds.

shielded enhanced Category 5 cable. 1000Mbps networking is completely backward compatible with 10/100 based networks, so you will be able to mix and match various speeds in your network. The most common scenario to envisage is a series of workstations with 10/100 baseT network cards connected to a switch with a gigabit uplink and fast connection to a server with a series of 1000Mbps NICs (Network Interface Cards) inside. The gigabit networking level is present at a switch-to-switch and switch-to-server level, placing the faster speed capability at the busiest point of the network (see pyramid).

To get complete 1000Mbps throughout, your workstations will all have to be equipped with Gigabit Ethernet NICs, connected to gigabit switches through CAT5e cable, which in turn are connected to a Gigabit Ethernet equipped server. This is what Apple are proposing to accomplish with their new gigabit enhanced G4 range – but is it overkill?

Who will benefit?

There is a clear argument for Gigabit Networking at the switch and server levels of a network pyramid, and indeed, the Gigabit Ethernet Alliance at www.gigabit-ethernet.org state that as the only use they can immediately envisage for 1000Mbps data transfer. Those lucky people who have money to burn and itchy fingers for technology will be wondering if it is worth extending gigabit networking speeds to their desktops.

At the invitation of D-Link, we visited the UK heats of the 'World Cyber Challenge' at the Millennium Dome earlier this year. 128 Evesham PCs were equipped with D-Link 10/100 DFE 530TX network cards, running up to eight DGS-3225G stackable gigabit switches, which then lead to a series of Evesham servers via Cat5e cable. It was the largest ever D-Link live network, and a testament to D-Link that it performed flawlessly throughout the day. The word 'lag' never passed the lips of that eager bunch of games players.

Most multi-player network games don't transfer all that much data across the network, and in fairness the World Cyber Challenge could well have survived with a 100 per cent 10/100 based network. I hope you'll forgive me for coming back to Apple, but it's those Mac boys and girls who have got the right idea of practical gigabit ethernet for the desktop. The single compelling argument for expanding gigabit ethernet to the desktop is file transfer times.

Macs are commonly used in digital video, artistic and graphic environments where extremely large files are passed from user-to-user as a matter of course. By and large, this is done on a peer-to-peer level, completely avoiding the switch-to-server path. Even here, the performance increase at a peer-to-peer level is going to be negligible. So only one argument remains – future proofing. Should you buy in to gigabit networking at the workstation level now, so that you'll be safe in the future? Most probably not. Gigabit ethernet is still a new and expensive technology and by the time it is seriously of any use, it will likely have been superseded by an even faster standard, so Gigabit Networking will then be affordable. Unless you're running an expensive server farm with a heavy load, tighten those purse strings and wait for the technology to unfold.

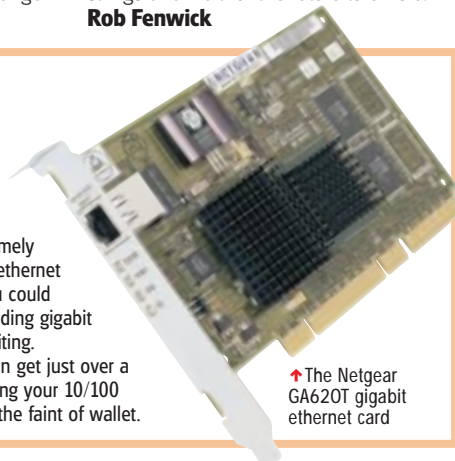
Rob Fenwick

→ Giga-costs

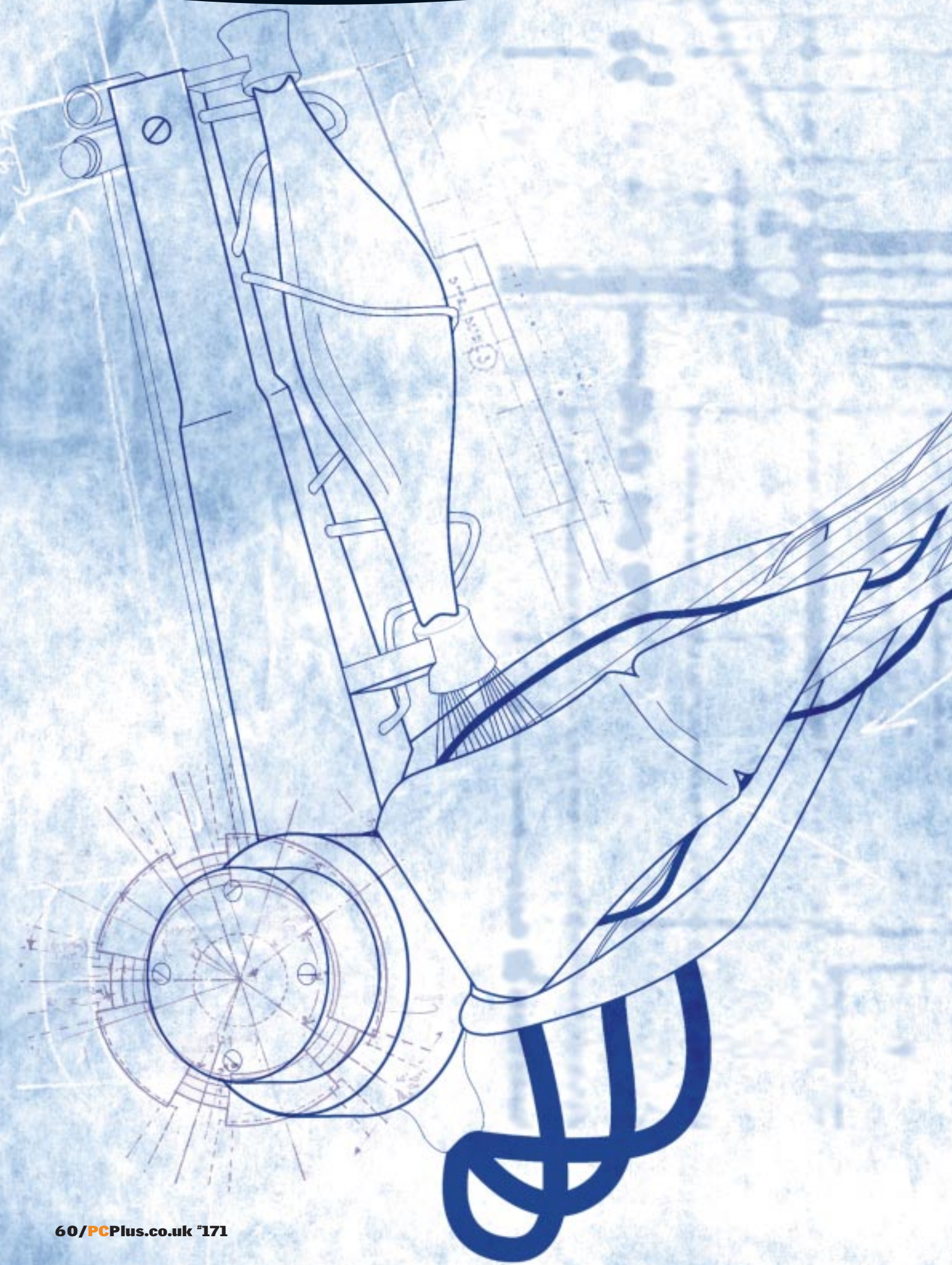
How much can you expect to pay, should you choose to invest in gigabit networking?

Gigabit ethernet is a new technology, and as such is still extremely expensive. We chose the Netgear GA620T as a typical gigabit ethernet card. If you chose to purchase this card at www.dabs.com, you could expect to pay £229 all inclusive. An FS518 16 port switch including gigabit uplink from Netgear will set you back £1,173 at the time of writing.

Add to that the cost of enhanced category 5 cables – you can get just over a foot of cable per pound, and you can see how quickly upgrading your 10/100 network can become very expensive, and it's certainly not for the faint of wallet.



↑ The Netgear GA620T gigabit ethernet card





Heavy metal

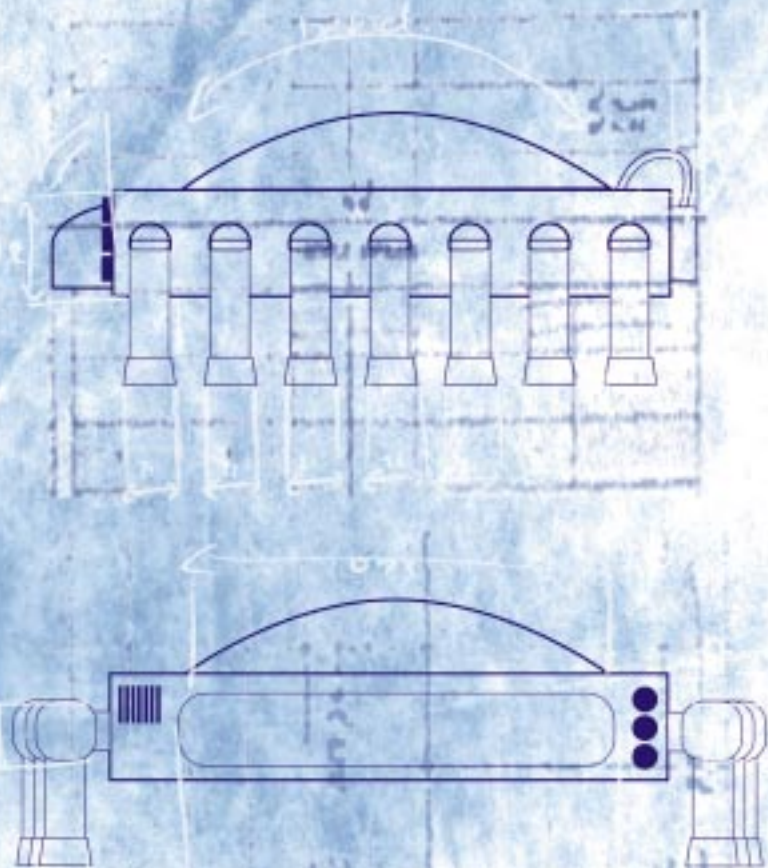
Will robots evolve to become the dominant intelligence on this planet, or will they never become more than slaves and curiosities?

The concept of intelligent, self-aware, free roaming robots is an abiding theme in science fiction and it's an idea that fills even the least imaginative mind with questions and speculations. In the past, the question was whether such devices would ever exist. Now, the question is how much do they cost and how long will it be before you buy your own robotic home help.

Mankind has long had a fascination with the idea of humanoid automata. From way back in early mythology there have been stories about statues that came to life and which could be commanded by a human master. More recently, clock and music manufacturers created elaborate animated models that rang in the hour, or performed in time to music. Although many pre-mechanical stories may have been more about having power, most such tales recognise the value of a controllable, slave that could do your bidding. In fact, the word 'robot' derives from the Czech word 'robota' which means subservient or slave labourer.

Human performance is variable even at its best, but under arduous or repetitive conditions, performance can become very ragged indeed. That might be acceptable when the results matter to no one but the person in question, but in manufacturing variable quality is unacceptable. It was a desire to increase output, reduce costs and eliminate human imperfection that led to some of the first industrial robots, and it's that same requirement which has fuelled their development to the present day.

As robots replaced humans on the production lines, it led to fears that robots would eventually replace humans in every area of the workplace. Initially, that was far from true because more robots required more people to build them, more people to operate them and more people to construct the new robotic plants. Last year in Tokyo, the bi-annual International Robot Exhibition took as its theme, 'Man and Robots Evolving Together'. Robots are being developed in areas that one would never have believed could become their domain, and robophobes may have something real to worry about at last...



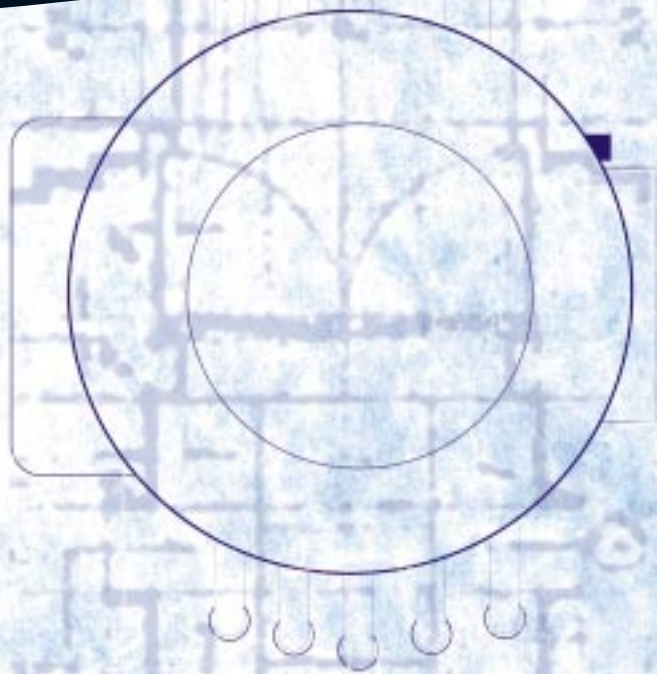
Much as people may fear the arrival of robots en-masse into our daily lives, there are many potential therapeutic benefits. Play is a vital part of personal happiness, and Sony's robotic puppy Aibo has artificial intelligence and doesn't mess on your new carpets. Curiously, Sony considered incorporating a robot death function when they designed Aibo, but they ultimately decided against it. Just as well seeing as it costs over £1,200.

In answer to Aibo, Japanese company Tamron has developed a furry robo-cat called Tama. Tama displays the six basic animal emotions: satisfaction, anger, uneasiness, dislike, fear and surprise, and it responds to the tone of your voice. It actually learns about you and its environment. It loves to be stroked and research shows that stroking pets lowers your blood pressure and thus reduces stress.

In Japan, Dr Nakajima has been developing a robotic horse that simulates the different feelings a rider experiences as a horse goes through different types of movement. Horse riding therapy is already in use around the world, and Dr Nakajima believes that his system may provide medical benefits to the elderly without the inconvenience or danger of having to ride a real horse.

We've all seen animatronic models used in TV and movie production, but now it's gone a step further. In Japan, Mitsubishi Heavy Industries has been working on robotic fish. The fish looks like the real thing and numerous sensors tell it about the currents around it, enabling it to swim like a real fish. Although this might seem like a trivial way to spend over a million dollars, the project has a more serious side. The technology has been used to resurrect long dead or rarely seen species such as the coelacanth. Mr Yuuji Terada at MHI, which also manufactures submarines, says, "The idea of this fish fin movement could be applied to realise the difficult technology of submarine hovering."

You might have thought that the arena of faith and religion would have been one of the last places that you'd find robots but you'd be wrong. In India, the Hare Krishna group has just built a new multi-million pound temple called The Glory of India. It includes nine robotic figures that portray Hindu gods and they will enact



scenes from epic texts as well as reciting scriptures using the voices of popular Indian actors.

One of the greatest limitations in the development of new computers and new robots is the sheer amount of money and research time that's required to bring new models to fruition. Hod Lipson and Jordan Pollack at Brandeis University in Massachusetts, USA, have revealed one exciting solution. They've created a computer that develops and builds robots.

Its system uses a virtual reality environment in which virtual robots exist. The computer has been given a simple task – develop the most efficient robot for horizontal movement across a surface. The computer is supplied with a first generation, as well as a palette of rods, actuators and cables. The computer then evolves the robots through hundreds of generations, terminating less efficient models and developing those that move more effectively. Darwin would certainly have appreciated the experiment because it's nothing less than natural selection in its most uncomplicated form. At the end of a 600 generation cycle, the computer was permitted to build the new robots using a prototyping machine.

In fact, movement is still one of the fundamental obstacles impeding development in other areas. There are so many ways of moving a robot through space, but variable and unknown terrain means that forms of locomotion that are great in one environment are terrible in another. One approach is to develop a bipedal robot that copies human movement, if not our speed. Honda's new Humanoid Robot P3 turned heads recently when it was unveiled. This robot has arms and legs and a head just like us. It also houses a powerful computer in its backpack, which combined with multiple sensors throughout its body, enables it to walk, respond to its environment and perform tasks.

However, a vastly more interesting and practical solution to the movement dilemma is offered by Polybot, which is under development at Xerox Palo Alto Research Centre. Polybot's creator Mark Yim was trying to come up with an inexpensive, modular system that was capable of traversing any type of terrain. His robot consists of small links that can rearrange themselves into different shapes.

On flat surfaces, they can form a wheel that rolls along, in confined spaces they form a chain that can move snake or caterpillar-like through small spaces. In rugged terrain, they can even form a kind of spider form that walks over or around difficult ground. Mark eventually envisions a system whereby Polybot can form far more complex shapes, so that in an earthquake rescue situation for instance, where it would be too dangerous to send humans, his robot could wriggle into small spaces, find trapped survivors and even reform into a survival dome that prevents additional rubble collapsing on top of the victim.



➤ R100 is a domestic robot. It can follow you around, read your e-mails to you, watch your house and much more.

When it comes to dangerous environments, robots are becoming increasingly essential. In the shadow of Chernobyl, the San Francisco earthquake and the King's Cross fire, we all understand that there are many complicated threats all around us. There are numerous situations where it's not desirable or even possible for humans to put themselves directly at risk: bomb disposal, mine sweeping, fire fighting, undersea rescue, reactor dismantling and arctic exploration to name but a few.

In Chernobyl, an American robot called Pioneer is being used to test the integrity of the structure in levels of radiation so high that even a protected human would exceed his safe lifetime dose in just three minutes. Meanwhile, in Britain the heavy plant manufacturer JCB has developed Fire Spy, a remote-controlled vehicle that can drive into infernos and remove dangerous chemicals before they go up in flames.

Whole new breeds of industrial utility robots are emerging with varying levels of autonomy and intelligence. Some are virtually disposable, whilst others cost more than the budget of a small country and can withstand incredible levels of abuse. One example is the Shadow Deminer, which is still at prototype stage. As its name suggests, it's a robot designed for finding landmines. It has an armoured body containing lots of sensors and eight two-metre long, prong-like legs and it looks for all the world like an electronic water bug. The idea of the system is that the expensive sensing equipment is kept inside the protective body, whilst the actual legs can be blown up at minimal cost.

Utility robots don't necessarily have to be purely industrial: the idea of robots to help out around the house is an appealing one that has been the subject of innumerable stories, but finally it's becoming a reality. The BBC's *Tomorrow's World* program asked people which home chore they found the most arduous, and the resounding answer was 'doing the ironing'. The Shadow Robot Company was then tasked with the job of designing a robot that could do the job for you. Although the robot is not yet complete, it's well under way. However, as its inventor, Richard Greenhill points out, "Beating a world grandmaster at chess is easy compared to this." Asked to explain, he told us, "Playing chess is a relatively easy problem with clearly understood rules and a single dimension. Even a simple task like tying a shoe lace is a multi-layered problem with many different elements to be solved."

Gecko's director, Martin Spencer, also has much to say on the complexity of bringing robots into the home. His company manufactures the CareBot, which he claims is one of the most advanced home utility robots in the world at the moment. It certainly doesn't look anything like the androids that Star Wars has taught us to expect: what it looks like is a vacuum cleaner, and a rather boring model at that. But as Martin points out, one of the most important roles for his robot right now is as an extra pair of eyes and ears. If you have an elderly relative, CareBot will live with them, following them around and checking that they're okay.

At any time, you can hook up to the robot via the Internet to see if granny is doing well. If she falls or has an accident, CareBot will automatically alert people who live close enough to help. Alternately, CareBot might check that your children arrive home from school on time, ensuring that your house is intruder free before they arrive. Then it'll play games with them until you get home. If they're late, it'll ring you at work to let you know. Oh, and CareBot will also do the vacuuming!

One of the key phrases when it comes to autonomous household robots is 'recharge to run rate'. This describes how long it can run before it needs a recharge, and how long it takes to recharge when one is needed. The CareBot is exceptional in that it has a recharge time of 6-8 hours with



➤ **Honda P3** – Honda's P3 is one of the most advanced walking humanoid robots in the world. It can keep its balance and pick things up. Its processor is in its backpack.

a run time of up to 36 hours. Many robots can only run for a couple of hours at most, then require two or three times that long to recharge.

CareBot achieves its impressive rate by isolating the brain (a household computer) from the mechanics. The controlling computer plugs into the mains and communicates with CareBot over a range of up to 300 feet using radio waves. This approach provides massive power savings.

An even better solution is a computer that literally runs without power. Scientists at the University of Notre Dame have developed a system that requires just a small amount of power to kickstart it, but which will then continue to run power-free. The system uses a technology called Quantum Dots, which organise and harness the power of electrons. The only draw-back is the fact that the technology only functions at minus 272.9 degrees, which is just above absolute zero, so unless you like your house cold it still has some development ahead of it...

➔ Look out Ronaldo

Can robots to win the World Cup?

An exciting example of the unbridled ambition and optimism of robot builders is the robotic soccer world cup event Robocup. This entertaining event is held yearly, with five leagues. The event is run to stimulate the development of artificial intelligence and robots that can work co-operatively. The teams consist of a number of autonomous players, each of which whizz around the pitch trying to bump the ball into the net.

At the moment the event is more comical than athletic, with the robots frequently breaking down, bumping into each other and trapping the ball. However, with each passing year, the criteria are made a little tougher so that the competitors are forced to develop ever more advanced control and interaction programs.

The highest and most challenging division at the moment is the Sony legged robot division, currently played using modified Sony AIBO robopups, but a humanoid league will start as soon as there are enough sufficiently reliable bipedal robots to compete.

The British Association hosts a similar event at its Science Festival each year. Organised by the University of Reading, this two-a-side event is confusingly called Robot Volley Ball, even though it's played using a softball. The ball is served and must simply be returned

within 60 seconds. Even this seemingly simple task was way beyond the capabilities of many of the University robots that competed in the 1999 event.

Such sport competitions demand skills across many scientific disciplines, but one of the key elements is the ability to make autonomous robots work co-operatively. This concept is explored by Rush Robnett's swarming robots – a set of relatively dumb, inexpensive robots that can work together to perform searches or other function more efficiently than individual, more intelligent robots.

Technology has a long way to go, but we leave you with the Robotic World Cup organiser's mission statement: "By mid-21st century, a team of fully autonomous humanoid robot soccer players shall win a soccer game, complying with the official rules of FIFA, against the winner of the most recent World Cup."

A great solution to the problem of robot power must surely come in the form of robots that feed themselves using commonly available materials. This class of robots has been dubbed 'gastrobots'. At the University of South Florida, Englishman Dr Stuart Wilkinson has developed a neat robot that has been informally named Chew Chew. It subsists entirely on a diet of sugar, and produces no waste products except water and carbon dioxide. Dr Wilkinson's next generation machine will survive solely on orange juice, will be humanoid in appearance and will be capable of feeding itself when it gets 'hungry'.

One of the more bizarre gastrobots is actually a serious industrial pest-destroying robot designed for farmers. Called the Slugbot, it trundles around farm fields picking up and squishing slugs. The remains are then dropped into a hopper on its back in a slug version of *War of the Worlds*. The hopper is then emptied into a fermenting bin where bacteria breaks down the slug remains, producing gas which the robot then uses as a power source.

If that seems a little too much like a slug eating version of *Terminator*, consider the new Roboguard security robot, which has been developed by Pitikhat Sooraksa of King Mongkut's Institute of Technology in Thailand. The robot can be armed and enabled to use deadly force via the Internet. Despite the inevitable knee-jerk reaction of horror from some scientists, if you were a hostage, you might be very relieved to know that an armour-plated Roboguard was standing behind the person holding you against your will (unless he was controlling it, of course...)

Whether it's in a field hunting for slugs, in your house following grandma or on Mars taking photographs, a robot needs to be able to navigate, and that has proved to be one of the more complicated problems. It's a problem of two halves: the first challenge is for the robot to know exactly where it is at any given time. It may use custom electronic or visual markers to keep track of its position. In the recent Cyber Challenge, teams of schoolchildren using Lego Mindstorm kits had to create robots that navigated a racecourse. Many of the robots used a visual system to follow a black line on the course. A more advanced version of this solution is to use GPS satellite navigation, which is the approach adopted by Slugbot. This has the advantage of working anywhere on the globe.

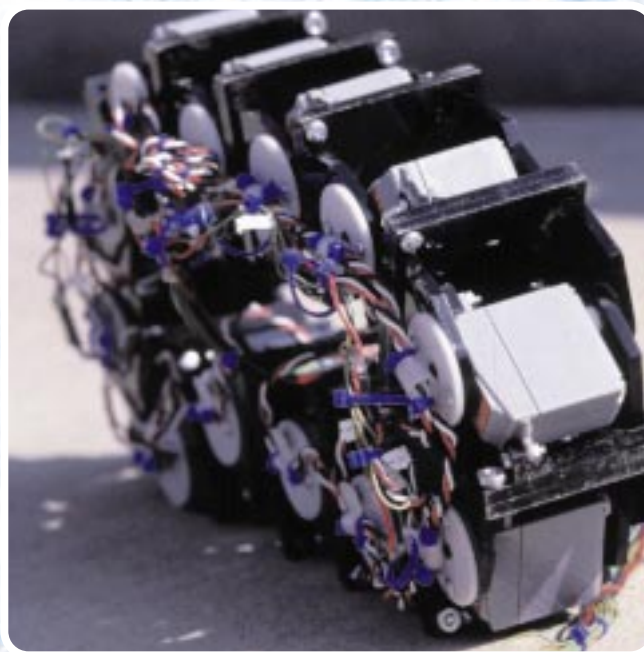
Whichever system is used, the robot can quickly run into problems if it encounters unexpected obstacles. Which leads us to the second part of the navigation problem. Basic navigation systems simply connect the user to the robot, and via a camera or virtual model, enable the user to directly control the robot's movements, which is fine unless the whole point is to create an unattended robot, or the robot is too far away to issue real-time commands or a problem occurs that requires very rapid interaction. A solution to the latter predicament may be under development at the University of Tübingen in Germany, where they're developing systems that enable paralysed patients to type using nothing more than the power of thought. At the moment, it takes about six seconds to type a single letter, but as brainwaves are better understood, a much faster rate is inevitable.

The next level of navigation is a robot that does have autonomy but when it encounters an unexpected obstacle in its environment, it simply backs off a little, turns a little and tries again. The ultimate level, for now at least, is a robot such as CareBot that can detect obstacles in advance and has the intelligence to plot a different route from A to B.

Finally, all the pieces are starting to fall into place, and robotics are fast moving from the realms of science fiction into our everyday lives. Toys like Sony's Aibo robopup are becoming more affordable all the time, and it's



↑ Slugbot will be a slug's worst nightmare. It'll drive around fields hunting them down and squishing them. It will then power itself using gas from their fermented corpses.



↑ Polybot is an exciting modular robot that can reform to enable it to move in different ways according to the terrain to be traversed.

already cheaper to buy a robotic helper and guardian for your grandma than it is to put her in a home. It seems that the days when robots are as commonplace as cars is just around the corner.

Many scientists feel that computers will soon become self-aware, and may be able to reason and even argue with their owners. This may require new laws to govern just what things can be entrusted to robots, and how intelligent we allow them to become.

For those who can afford them, some of the drudgery that is part of our lives now, may eventually become a thing of the past. **PCP**

→ It's all about brains

Using artificial intelligence

One of the most important maturing technologies for next-generation robotics is artificial intelligence (AI). AI is the ability of a computer to mimic human cognitive and reasoning processes to some degree. Even seemingly simple tasks like moving can require a degree of AI.

A significant component is the development of so-called 'learning' computers. The important function of these systems is their ability to come up with entirely

new solutions to previously unencountered situations.

This is the reason for the existence of Robo-monkey, who's been developed at Nagoya University in Japan to explore exactly such artificial intelligence. The robot has been programmed with an understanding of the physics of motion, particularly swinging. It has also been given sensors and an awareness of its own physical body, and the position of its body in space. The challenge for Robo-monkey is for it to swing along a set of rungs even though it has never performed such an operation before.

One approach to artificial intelligence is to simulate the actual organisational structure of the brain, forming what are known as neural nets. These lack the raw speed of parallel processing systems, but are able to spontaneously form new connections and pathways

just like a human brain does. For a while, scientists have been looking away from the constraints of silicon towards biological computers. One of the first is the Leechulator, which has been developed at the Georgia Institute of Technology using leech neurons. Professor Bill Ditto, who leads the project, says that he's amazed that today's computers are still so dumb. His team's bio-computer can 'think' for itself in original ways because the neurons form new pathways without needing to be programmed.

Meanwhile, in Colorado Hugo de Garis is working on an artificial neural net that has 377 million artificial neurons. These are comprised of transistors grouped in cells, which can stimulate the axons and dendrites that enable a neural net to learn in ways that would be too complicated to program.

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How much do you need to spend for a good PC? **Simon Williams** looks at machines at prices around £499, £699 and £849 – and doesn't award all the gongs in the top price bracket

You pay your money...

You get what you pay for' is a hoary old truism that suggests bargains are hard to come by. When it comes to PCs, though, the mix of specifications of machines at a given point makes 'it pays to shop around' a better maxim. If you have a limited budget for a good all-round leisure and home business PC, you will probably scan the PC mags, looking for a balanced review of PCs in your price range. In any given month though, there's a good chance your particular price won't be covered in a review group.

I'm trying to give you a lot more choice in this group by testing machines in three different price bands in the same review. Here, I'm testing two bargain basement PCs at around £500, where I'll be looking for core functions, a reasonable turn of speed and a monitor that won't make your eyes water.

However, I'll also be testing four PCs at about £700, where you can expect a machine with more processing muscle, more memory and a better graphics sub-system. A quick look over the shoulder at last month's £699 group for comparison won't go amiss, either.

Finally, at the top of the poll, there are four £850-ish PCs, where you really should expect to see good graphic accelerators, a lot of base memory and processors close to the quickest you can buy. You don't have to pay over £3,000 any more for a system with a cutting-edge configuration.

So, something for everyone, then, but there's the added interest of a general comparison between the price groups. What extra value do you get for the extra £200 or £350, over the price of a basic machine, and is it worth those amounts of money? There are some surprises for you here, in this new-look, three-way review.

→ People Power – call the shots yourself

Three years or so ago, **PC Plus** fought a campaign against suppliers who bundled software on the hard drives of their machines, but didn't include the master disks for the programs. The suppliers doing this included a routine to off-load the programs to floppy disks, but didn't supply the disks and left the copying to you.

By making readers aware of this scam, enough pressure was put on suppliers to persuade them to supply master disks, and more recently, master CDs. Now, however, a more fundamental trick is being tried by Microsoft. The company is 'encouraging' (by offering discounts) large PC suppliers to create their own 'rescue' CD for Windows Me, which may or may not be a copy of the original retail product.

This means that when you buy a PC from some suppliers, you will only get a full installation of Windows on your hard drive and the facility to repair it, should something nasty strike you.

We would strongly urge you to insist on a full Microsoft-authenticated installable version of your operating system on CD – that's what you're paying for. If everybody refuses to put up with less than this, we have the power to make even MS change its policy. If you ever need to reformat your hard drive, we promise you'll appreciate having the full, installable version of the operating system that you've bought and paid for.

→ Plain English glossary

Confused by the jargon? Help is at hand...

AGP SLOT

An internal slot in your computer that provides a faster path for data. Graphics cards using an AGP slot will usually perform better than similar cards in PCI slots.

CD-RW DRIVE

A drive that is able to read CDs and write information to CD-Rs (CDs that can be written to once only) and CD-RWs (CDs that can be reused like a floppy disc).

CHIPSET

A chipset provides the basic or core functionality of a device. They can be found in sound cards, graphics cards and just about every other piece of computer hardware.

DVD DRIVE

A DVD drive is able to read the latest high-capacity DVD discs, as well as CDs. With appropriate decoder software or hardware, you can watch DVD movies on your PC.

GB OR GIGABYTE

A measure of a storage area (or memory) within the PC. One GB is equivalent to 1024MB.

HARD DISK OR DRIVE

A device inside your computer where you store all the information you want to keep permanently, even when the machine is switched off.

INK-JET

A type of printer that squirts a tiny jet of ink on to the printer. They are particularly well suited to home and small office applications.

ISA SLOTS

An old method of adding internal cards with extra features to your PC. Many new computers have no ISA slots.

MB OR MEGABYTE

A measure of a storage area (or memory) within the PC. Equivalent to 1024 bytes, a basic unit of storage.

MHZ

This measures the speed of a PC.

MODEM

The device that connects your PC to the Internet. Most new computers come with them as standard. Make sure yours is V90 compliant.



MOTHERBOARD

See system board.

PCI SLOTS

These allow you to plug in expansion boards with extra features inside your PC. Typically, modern sound cards and modems are fitted to PCI slots.

PROCESSOR

The engine at the heart of your PC. Speed is measured in MHz – the faster the better.

RESOLUTION

Basically, this reflects the amount of information you can see on your screen. The higher the resolution, the more you can see, by making everything smaller.

SUPERDISK DRIVE

Reads and writes information to special 100MB discs. Can also read and write to normal floppy discs.

SYSTEM BOARD

The panel inside your PC, into which everything else is plugged, including power, processor, memory and graphics card.

ULTRA DMA 66 AND 100

An agreed standard, used to link the hard drive to the computer. Ultra DMA 100 – the fastest available today.

USB

Short for Universal Serial Bus, it is an easy-to-use standard for connection peripherals, such as printers and scanners, to your computer.

V90

This is simply the fastest agreed standard for modems over a normal telephone line. If you buy a modem, make sure it is V90 compliant.

ZIP DRIVE

Iomega's Zip drive has been around for donkey's years. It can read and write information to special discs and is available in 100MB and 250MB versions.

Buying advice

What you should look for when choosing your PC

If you're new to PCs, it's often difficult to tell the difference between a machine that is genuinely good value for money and one that is cosmetically appealing. Most PCs look very similar on the outside.

Differences in appearance that mean something are subtle. Things like the type of plastic used for the front panel of the PC, the keyboard and the mouse indicate the price of the component and are a guide to the likely quality of the hardware. If these items appear to be made from the kind of plastic used in cheap children's toys, with a slightly soapy sheen to it and less intensity in the colour, it's likely to be a cost-cutting component.

Good quality PCs should be housed in densely coloured plastic, more the kind of material used in good quality domestic TVs and videos. Check the metalwork at the back, too. The blanking plates for the expansion slots should be separate from the case metalwork, not all stamped from the same metal sheet – doing this is another cost cutter.

How about specifications, then? Surely the scientific approach to sizing up a piece of technology should provide a good indicator of its worth? In principle, yes, but there are plenty of ways of selling a machine on specifications which hide its true value, or lack of it.

General terms like 'massive hard drive', 'superb sub-woofer system' or 'finest SoundBlaster 128 sound card' are meaningless, as they're subjective comments and don't compare the items they're extolling with anything else. A massive hard drive, compared with the 10MB one I've just taken out of a 15-year-old Amstrad PC, doesn't sound quite so impressive. Similarly most sub-woofers would sound superb when compared to two baked bean cans joined by a piece of taut string.

Look for quantifiable facts in specification lists. '64MB of memory' is an exact specification, as is '700MHz Duron'. '500MHz processor' isn't, as it could be a previous generation of chip, such as a Pentium II or AMD's K6-II. Even those specifications that appear exact can be open to misuse, too: '56K modem', or even 'V90 modem', can cover a variety of different devices, from a cheap-and-cheerful software modem,

where quite a lot of the work is carried out by software running on the main processor, to a WinModem, to a fully fledged hardware device, where separate silicon does all the work on its own, leaving your main processor to get on with other things.

There aren't many ways of getting round this kind of hokem, as the trading standards office can be left a little behind by the technical nature of PC specifications. In general, the larger chains of PC outlets are pretty clear in what they are describing, although you do have to be aware that some assistants' enthusiasms may outweigh their technical expertise.

In the end, there's no real equivalent for the test drive you would want when you're looking to buy a new car. Learning to use a new PC is more complicated than driving a car, as you will have had several hours of lessons before passing a driving test, while you may easily come to your first PC completely cold.

Without trying to look too smug, one of the best ways of making at least a preliminary choice of PC is to read magazine reviews. If you weren't allowed a test drive of a new car, you might take the opinion of an experienced advanced driver as a good second best. Your needs are bound to be slightly different from everybody else's, but there'll be enough in common for expert guidance to be a useful substitute to getting behind the wheel.

Where to buy

When you come to buy your computer, there are two basic options: the high street and mail order. If you go along to a shop, you'll be able to touch and feel your PC before you buy it. This can be a more reassuring way to buy but the bargains are most often to be found in the world of mail order. And as long as you pay by credit card, you have the peace of mind of being covered against fraud. The cases of people suffering at the hands of mail order companies are the exception, rather than the rule. Check our **Campaign** section regularly for repeat offenders. The real advantage of direct buying is that you can specify exactly the system you want, rather than having to buy one off the shelf.

What to look for

The most important parts of your new PC



1 HARD DRIVE

Hard drives continue to fall in price and you should expect at least 10GB in even the most modest of systems. Interestingly, the highest capacity hard drive in this review is fitted in one of the cheapest systems. Virtually all hard drives are cabled up for the faster, UltraDMA 66 standard, now.

2 DVD DRIVE

Cheaper machines often have CD-ROM drives fitted rather than DVDs, and the latter option can play DVD movies as well as all kinds of CDs. Speed is an issue with both types of drive – it varies from 40- to 52-speed for CDs and from 8- to 16-speed on DVDs – but there's a lot of hype involved in quoting the big numbers.

3 PROCESSOR

From a 650MHz Celeron to a 1GHz Athlon, the processor at the heart of your PC can make a difference of over 100 per cent to its overall performance. Even the slowest chip reviewed here, though, will be able to handle all but the most demanding of applications.

4 MONITOR

17 inches is fast becoming a standard size for all but budget PCs, which may still offer 15-inch displays. Truly flat tubes are also coming in, but are still restricted to the higher price points. A flat tube gives a clearer and often higher contrast picture, but check the refresh rate, too.



Pacific PC 700 PLUS

PRICE £599 **EX VAT** £510 **SUPPLIER** Pacific PC
PHONE 01923 894888 **ONLINE** www.pacificpc.co.uk

Pacific PC makes a welcome debut with its 700 PLUS, a machine you could easily pay £800 for elsewhere

What you get

Far from scraping the barrel at this relatively modest price point, Pacific PC has managed to put together a very commendable PC, including a few features that some in the £699 category should envy. Take the system board, for instance – an A7V unit from Asus – which includes a promise controller for Ultra DMA100 hard drives. Although the hard drive here is a more down-to-earth UDMA66 device, it weighs in at 28.6GB, the largest capacity in the entire review, by a good margin. There's a DVD drive in there, too, where many would have put a CD.

The 700MHz Duron processor is an above-average choice and it's coupled to 64MB of PC133 memory. There's a hardware modem in there too, in one of five PCI expansion slots, and a LeadTek GeForce2 MX graphics adaptor to make the average game player salivate.

The monitor is a 15-inch ADi unit which gives a poorly focused picture at 1024 by 768. It's fine at 800 by 600 pixels, though. The speakers are bigger than I'd expect, giving fair sound.

In use

The SYSmark benchmark returned a **PC Plus** Index of 1.32, very much in line with Big Red's Duron 700, which costs £200 more. The 3DMark result was considerably better than Big Red's though, thanks to the GeForce2 MX card, which boosted the indexes to over 4,400.

Service and Support

Pacific PC offers a three-year, collect-and-return warranty with the Pacific 700 Plus, which includes parts and labour in all three years. This is an extremely good deal and comes as a pleasant surprise in a machine at this price point

Conclusion

This is an excellent system for the money, and comes complete with a bundled copy of SmartSuite Millennium. It's a machine that many companies would charge a whole lot more for. It's equally at home on serious and leisure software and, apart from the monitor which should be kept to a resolution of 800 by 600, comes with our wholehearted recommendation.

PCPlus Verdict

PACIFIC PC 700 PLUS	
✓ FOR	✗ AGAINST
→ 28.6GB hard drive!	→ Little of consequence
→ Fast Duron chip	
→ GeForce2 MX graphics card	
Specifications	10
Quality	9
Value	10
Performance	8
OVERALL	10



Titan Nemesis

PRICE £599 **EX VAT** £510 **SUPPLIER** Titan
PHONE 0870 442 1248 **ONLINE** www.titanplc.com

Titan has done a fair job with its Nemesis, but there are a couple of careless omissions and settings

What you get

Titan does more of the kinds of things I'd expect for a machine built to a budget. Some are good, others less so. The machine is built around a 650MHz Duron with 128MB of memory, which should leave you fairly future proof. The hard drive is a less-than-generous 9.51GB, though, and the removable media drive is a 52-speed CD, rather than a DVD.

Titan uses a 32MB Riva TNT2-based graphics card, which won't please the gamers much, but is quite adequate for general home office work. It runs to a 15-inch Daewoo monitor, which gives a much sharper picture at 1024 by 768 pixels than Pacific's, but has a top refresh rate of only 60Hz, so is more flickery.

The multimedia keyboard is useful, with its extra keys for CD transport and Internet access and the Microsoft Intellimouse is still a very good pointing device.

should really have been sorted before delivery.

Service and Support

Titan offers a year's full back-to-base warranty, with a further four years, labour only. This is better than the statutory minimum, but the cost of returning the machine is yours.

Conclusion

Purse strings are bound to be tight on a machine coming in at £510, but the generous memory allocation is not well balanced with a hard drive of under 10GB. A good set of utility software bundled with the system on top of SmartSuite is welcome, but overall the Nemesis doesn't stand up all that well against Pacific PC's 700 Plus machine opposite.

In use

Results from the Nemesis were unimpressive, with the Polar the only system with a lower **PC Plus** Index (though by a big margin). 3DMark was also not a winner on this machine, more so as Titan hadn't installed DirectX 7, the game routines for Windows which should be on all PCs bought these days.

If you let the machine sleep for too long, it is sometimes difficult to get it to wake up. This might just be a matter of a suspend setting problem but, if so, the settings

PCPlus Verdict

TITAN NEMESIS	
✓ FOR	✗ AGAINST
→ 128MB memory	→ Small hard drive
→ Useful utility software	→ Dodgy suspend settings
	→ DirectX 7 not installed
Specifications	7
Quality	6
Value	7
Performance	7
OVERALL	7



Atlas Meridian D750PL

PRICE £799 **EX VAT** £680 **SUPPLIER** Atlas Technologies
PHONE 07000 285275 **ONLINE** www.atlasplc.com

Atlas has come up with many a fine system... alas here it's let down by some of its chosen components

What you get

Atlas supplied its Meridian D750PL in a mini-tower case, which restricts expansion but does take up a fair bit less space. Here, though, the case has a fairly substantial footprint, so it's mainly the height you lose.

A DVD drive and a floppy drive are fitted in the front of the case and inside the box is a 19GB Fujitsu hard drive. The processor is a Duron, running at 750MHz, the first we've seen at this clock rate. It's coupled to 64MB of main memory and, more impressively, to a 32MB 3DProphet II MX card from Hercules.

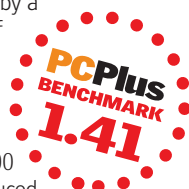
This graphics signal is fed to a 17-inch CTX monitor, which has a reasonably flat face and a nice clear display. The control system, based on LEDs and buttons and no on-screen display, is refreshingly easy to use.

In use

There were a few problems with this machine. For a start, the CTX DVD drive had a lot of trouble reading CD-R disks and some trouble reading regular CDs, too. Then the floppy drive refused to eject our test disk. It appeared the front panel of the case wasn't properly aligned with the floppy drive slot.

Performance tests showed the Duron 750 to be doing its stuff and to be the fastest Duron we've tested so far. The machine's **PC Plus** Index of 1.41 is very commendable and was

accompanied by a healthy pair of 3DMark 2000 indexes, over 4,500 at both resolutions. The Video 2000 test also produced a very strong result.



Service and Support

Atlas offers a one-year on-site warranty with the Meridian, which means you don't have to worry about shipping it back if anything should go wrong.

Conclusion

The Meridian D750PL is a mixed bag. While it's built in the most part from quality components, the CTX DVD drive and the case and floppy drive alignment need to be replaced or revamped. When we did get it working, it was quick and easy to use, but overall, we can't recommend this system.

PC Plus Verdict

ATLAS MERIDIAN D750PL

✓ FOR	✗ AGAINST
→ 750MHz Duron	→ Flaky DVD drive
→ 3D Prophet II MX graphics adaptor	→ Badly aligned floppy drive and case

Specifications	8
Quality	5
Value	6
Performance	8
OVERALL	6



Big Red Evolution 700/D

PRICE £799 **EX VAT** £680 **SUPPLIER** Big Red
PHONE 08700 711117 **ONLINE** www.bigred.co.uk

Big Red's Evolution 700/D is a nicely configured machine, but has little outstanding to recommend it

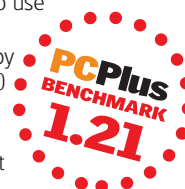
What you get

Big Red has based its midi-tower machine, complete with blue plastic highlights on the case, on a Duron 700 processor. There's a Sony DVD drive in the top bay and a standard floppy drive below this. 128MB of 133MHz memory accompanies an 18.9GB Samsung hard drive for permanent storage.

The Microstar system board has six PCI slots, so there's plenty of room for internal expansion and only one is taken up in this configuration by a software modem. Graphics support is provided by a generic nVidia Riva TNT2, with 32MB of memory. It feeds to a 17-inch AOC monitor which gives a clear, well-balanced picture up to 1204 by 768.

Sound comes from the VIA chipset on the system board, but feeds to a trio of Tsunami speakers which are a cut above the norm. Their metallic silver-bronze cases look a bit gaudy, but they sound good with substantial bass support.

comfortable to use and Big Red bundles a copy of Works 2000 with the system, though it's not the full suite.



Service and Support

Big Red provides a one-year back-to-base warranty, on to which it adds lifetime labour coverage, where you just pay for any replacement parts – and sending the machine back to base.

Conclusion

This is by no means a bad machine, but there's nothing to make it stand out from the crowd. It does what's needed on the performance side, though the problem with the video benchmark needs sorting. Even with this fixed, it would be good to see a faster graphics card in the Evolution.

PC Plus Verdict

BIG RED EVOLUTION 700/D

✓ FOR	✗ AGAINST
→ Duron 700	→ Graphics performance below par
→ Good-sounding speaker trio	→ Basic software bundle

Specifications	8
Quality	8
Value	7
Performance	8
OVERALL	8



Digital Network DN100 (J)

PRICE £799 **EX VAT** £680 **SUPPLIER** Digital Network
PHONE 0870 444 1940 **ONLINE** www.wheredoesitend.com

From the look of its DN1000 (J), new kid Digital Network has a bit to learn about PC configuration

What you get

This is a different machine from a new company. It starts with a squat, grey-and-cream midi-tower case with an unusual fold-out side panel, holding the system board. While it may be unconventional, there's no reason why this layout shouldn't work, though you do have to uncouple the power cable to open it enough to add expansion cards.

The system is based around an 800MHz Athlon, which should give it a healthy turn of speed. This is backed by 64MB of main memory and a 19GB Maxtor hard drive. Removable storage is a 10-speed LG DVD drive and a standard floppy.

The GeForce2 MX graphics adaptor ought to give good results at the 17-inch Logix monitor, except that the monitor picture isn't as well focused as it should be.

In use

Results weren't as good as I expected from the spec. The SYSmark 2000 benchmark produced a **PC Plus** Index of 1.33, lower than Atlas's Duron 750, and the 3DMark figures were hopeless. I'd have expected three times the indexes I saw and the frame rates were around 10fps, much too low for enjoyable gaming experiences.

Digital Network supplied an optical, ball-less mouse, similar to Microsoft's Intellimouse Explorer – so similar I'd be surprised if there aren't MS lawyers at a Taiwanese door before too long. The multimedia keyboard suffers from not being recognised by Windows

until its USB drivers have been installed. And you can't get to the driver installation until you've typed in your licence details – Catch 22.

Service and Support

Digital Network provides a two-year on-site warranty, which should give you plenty of piece of mind. On-site cover means you should never lose the use of your PC for more than a day or two.

Conclusion

A bit of a tale of woe, really. For £680 you'd expect a machine with not just a good spec, but configured so all the bits work satisfactorily together. The results showed this wasn't the case – a shame, since other parts of the system show considerable promise.

PC Plus Verdict

DIGITAL NETWORK DN100 (J)

✓ FOR	✗ AGAINST
→ Fast processor	→ Poor keyboard installation
→ Easy service case	→ Cruddy graphics card installation
→ Good mouse and keyboard	

Specifications.....	9
Quality	5
Value	6
Performance	7
OVERALL	6



Polar Paragon 667

PRICE £799 **EX VAT** £680 **SUPPLIER** Polar Technology
PHONE 0800 138 1238 **ONLINE** www.polartechnology.com

The Paragon 667 would be superb if the processor was a bit faster. Probably only a tweak needed

What you get

I had to check Polar's covering letter to check the price of this – it's amazing value. The specification starts with a midi-tower case, containing both a DVD and a Zip 100 drive for intermediate level removable storage. Inside is a 19GB IBM hard drive. The processor is a 667MHz Celeron, with 64MB of RAM, which is not quite up to the faster Durons, but should still be able to run most software adequately.

Graphically the machine is well endowed, as Polar has put a 32MB GeForce2 MX card in there and runs it out to a 17-inch Hansol 710P monitor. This is a good display, near flat and clear.

On top of all this good stuff is an Epson Stylus Color 480 printer (entry level maybe, but still capable of some very respectable prints) and a Mustek ScanExpress 6000P 300x600dpi flat-bed scanner. There's even an Internet camera so you can phone your friends and grimace at them.

In use

All this would have put the Paragon well up in the award stakes, if it hadn't been for the machine's set-up. Most functions were hesitant or took longer to complete than normal. The machine produced a **PC Plus** Index of 0.82, below our 600MHz Celeron reference machine and refused to run Video 2000 at all – the GeForce2 MX card should have gobbled it up. The card did manage to hold the machine's end up on the 3DMark

tests, which gave indexes of around 3,000.

Service and Support

Polar provides a good warranty with the Paragon 667. A year's full back-to-base cover is supplemented by a further two years, labour only.

Conclusion

The Paragon is a missed opportunity. On the one hand, this system is streets ahead of the others in its price bracket on value. Although we didn't ask for printer, scanner or camera, these extras don't detract from the core of the system, which is well up to scratch, apart from the hardware set-up.

The jerky way the system responds is noticeably awkward and delaying in use. It pulls the overall score down.

PC Plus Verdict

POLAR PARAGON 667

✓ FOR	✗ AGAINST
→ Printer, scanner and camera	→ Set-up problems yielded low PC Plus Index
→ Zip 100 drive	
→ Processor and memory spec	

Specifications.....	10
Quality	7
Value	10
Performance	5
OVERALL	9



Dell Dimension 4100 866

PRICE £1,000 **EX VAT** £851 **SUPPLIER** Dell
PHONE 0870 907 5667 **ONLINE** www.dell.com

Dell has raised the potential for its Dimension 4100 simply by incorporating nVidia GeForce2 GTS graphics

What you get

Dell has put together a really hot potato for systems in this price range, with both a fast processor and a rocketeer of a graphics card. Dell's usual slimline tower case holds a Samsung DVD drive at the top with a standard floppy sitting a couple of bays below. Inside, there's an IBM hard drive as the third part of the storage triumvirate, though this is a disappointing 14GB, less than three-quarters of the capacity of most of the others here.

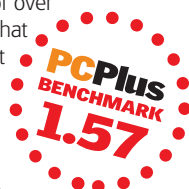
Dell uses an 866MHz Pentium III processor as the powerhouse for its Dimension 4100, with 64MB of memory and an Intel 815E chipset. Thankfully, the company hasn't chosen to leave the graphics processing to the Intel chip, which would have dragged its performance well down.

Instead, it fits an nVidia GeForce2 GTS adaptor, with a full 64MB of memory, which goes like the proverbial clappers. It runs to a 17-inch Dell-badged monitor with an unusually narrow neck, leaving space on the desktop for a bigger pair of speakers. Unfortunately it also gives the unit a more rounded tube face and Dell provides a pair of slight speakers, in every sense.

In use

While the SYSmark performance of this machine was prodigious, with a **PC Plus** Index of 1.57 beaten in this group only by the 1GHz Athlon in the Mesh, it's the 3DMark results that snatch at the breath.

Two indexes of over 6,000 show what nVidia's hottest cards can do and strongly suggest that this will be a great machine for games.



Service and Support

Dell provides a one-year on-site warranty, followed by two more years, collect and return. This is the best cover in the group, effectively giving you three years full cover, without the cost of having to return the PC to base.

Conclusion

The Dimension 4100 majors on 3D performance and there's nothing at any price in this group that can touch it. That's where it counts of course, but it could still do with a bit more hard drive space, to be a good all-rounder.

PCPlus Verdict

DELL DIMENSION 4100 866

✓ FOR	✗ AGAINST
→ 3D performance – phew!	→ 14GB hard drive, is not really large enough
	→ Meagre speakers

Specifications.....	9
Quality.....	9
Value.....	8
Performance.....	10
OVERALL.....	9



Mesh Matrix 1000GT

PRICE £999 **EX VAT** £850 **SUPPLIER** Mesh Computers
PHONE 020 8208 4705 **ONLINE** www.meshplc.co.uk

Mesh concentrates on processor and graphics, but performance isn't the only thing you should expect

What you get

Compare what you get in Mesh's Matrix 1000GT with the specification of its award-winning Matrix 700D from last month's group. This machine is similar in most respects, from its 19GB hard drive – a Fujitsu, in this case – to its 10-speed Pioneer DVD drive. It has the same 128MB of memory and the same Diamond Supra modem in one of the five PCI expansion slots of its Asus system board.

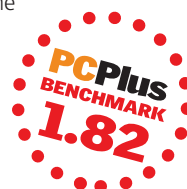
There are two key places where the two machines differ, though. The processor in this machine is a 1GHz Athlon, 300MHz faster than the chip in the Matrix 700D, and the graphics card is a Hercules 3D Prophet IIMX, considerably quicker than the ATI card from last month.

In use

As you would expect, performance results from the high clock-rate processor and the fast 3D accelerator showed up very well. The **PC Plus** Index drew an impressive 1.82, though this isn't the fastest result we've seen. A Pentium III 933 from Elonex scored 1.86 three months ago and Viglen's 850 PIII managed 1.80 in that same review.

The 3DMark scores were both over 4,200, which is enough to provide good response from most games, though again not as hot as, say, the 700MHz Duron and 3D Prophet card in Time's winning system from two months ago. The Video 2000 result was the

strongest of the bunch, but overall performance for the spec was a bit disappointing.



Service and Support

Mesh provides a year's on-site warranty with the Matrix 1000GT, followed by two years' back-to-base, covering both parts and labour. This is a good support package since you should have minimal maintenance charges for the first three years of the system's life.

Conclusion

So, for your extra £200 over Big Red Revolution's 700/D, the Matrix 1000GT gives you a 1GHz processor and a GeForce2 MX card. From my tests, the revised components don't really prove their worth and there are better options here.

PCPlus Verdict

MESH MATRIX 1000GT

✓ FOR	✗ AGAINST
→ 1GHz Athlon	→ Test results not up to spec
→ GeForce2 MX graphics adaptor	→ No intermediate removable storage
→ Good warranty package	

Specifications.....	8
Quality.....	9
Value.....	8
Performance.....	9
OVERALL.....	8



Simply Systemax A900RV

PRICE £999 **EX VAT** £850 **SUPPLIER** Simply Computers
PHONE 08707 297644 **ONLINE** www.simply.co.uk

Simply's take on Systemax is a well balanced all-rounder, but could do with a graphic driver update

What you get

Simply Computers is one of several suppliers that sell Systemax machines and has provided a PC that's well equipped to compete with the other £849 systems here. The midi-tower case has three drives arranged on the front panel, a 10-speed post-box style DVD drive, a 100MB Zip drive and a standard floppy.

Inside, an 18.9GB Samsung hard drive backs up a 900MHz Athlon with 128MB of memory. This should all lead to good performance figures, but there is even more to attract the home buyer to this package. As well as the nVidia GeForce2 MX-powered 3D Power graphics adaptor, there's a TV tuner card from ATI, which enables you to display analogue TV channels on the excellent – and completely flat – face of the 17-inch CTX monitor. This effectively provides you with a second TV to help calm those fights over programme choices.

In use

As you would expect, the performance of the Systemax was good, though not quite as zappy as I expected. In fact, the **PC Plus** Index was identical to Dell's, where the Athlon 900 should really have shown a clean pair of heels to Dell's Pentium III 866. The 3DMark results were good, so games players should have no problems, but several of the Video 2000 tests failed to display, so DVD playback may not be so hot.

Service and Support

Simply provides a three-year warranty with the Systemax, the first year includes both parts and labour, with the next two years covering labour only. This is a fair compromise, if you're not going to include on-site cover.

Conclusion

Simply has obviously given this machine some thought and has balanced a fast processor and memory with useful extras, like the a Zip drive and TV tuner card. The Athlon 900 should have been able to deliver a bit more of a kick, but in real life you're not going to notice any speed problems. A good software bundle, including a trio of playable games, completes a very good system.

PCPlus Verdict

SIMPLY SYSTEMAX A900RV

✓ FOR	✗ AGAINST
→ 900MHz Athlon with 128MB	→ Performance not tweaked
→ Zip 100	→ No master Windows CD
→ TV tuner	

Specifications.....	9
Quality	9
Value	9
Performance.....	8
OVERALL	9



Viglen HomePro P3 866 DLr

PRICE £999 **EX VAT** £850 **SUPPLIER** Viglen
PHONE 0990 486486 **ONLINE** www.viglen.co.uk

This month's Viglen HomePro is little improvement on last month's, but costs £170 more

What you get

Viglen's HomePro range covers a wide price and spec band. This £850 P3 866 DLr machine is in the middle of the range and is built around an 866MHz Pentium III processor. You'd think this would give Viglen a bit of extra budget to boost the rest of its system, but in fact it matches the processor with 128MB of memory, a 19GB Western Digital hard drive and a 10-speed Pioneer DVD drive, much the same fare as with the other £849 systems.

Graphics come from the Intel 82815 chipset, though with an extra 4MB of video RAM that plugs into the system board's AGP socket, so you could slap in a graphics adaptor instead. It runs a 17-inch Viglen DL7 monitor, which presents a fair picture on a nearly flat tube.

The HomePro P3 866 DLr comes with Windows Me – with no master CD – and a copy of Works 2000 (not the suite).

In use

The 866MHz Pentium III produced a **PC Plus** Index of 147, which shows fair performance, and this was evenly balanced between Internet and office programs.

Graphics performance was hampered by being the graphics section of Intel's 815 chipset. Like graphics from the 810 before it, there's little to like about this. It uses system memory for graphics, though it's less noticeable on a 128MB machine. The high-res 3DMark 2000 result was down to just over 1,200, which is very

unimpressive and even the 2D Video 2000 benchmark could only scrape 1,767, beaten substantially by the other three £849 machines here.



Service and Support

Viglen provides a year's on-site warranty, which is better than back-to-base cover, but not up to, say, Mesh's three-year offering.

Conclusion

I somehow expected more from a Viglen machine costing £850. Comparing it to the £680 HomePro from last month shows that all you get for your extra money is an increase in the processor clock rate from 733MHz to 866MHz. The software bundle on the £680 offering is considerably better than here. A disappointing system.

PCPlus Verdict

VIGLEN HOMEPRO P3 866 DLr

✓ FOR	✗ AGAINST
→ Good Altec Lansing speakers	→ Basic software
→ Ethernet adaptor included	→ No master Windows CD
	→ Unspectacular performance

Specifications.....	6
Quality	8
Value	7
Performance.....	7
OVERALL	7

→ Which PC?

Check the specs here...



CONTACTS

	700 PLUS	Nemesis	Meridian D750PL	Evolution 700/D
Supplier	Pacific PC	Titan	Atlas	Big Red
Supplier type	Direct	Direct	Direct	Direct
Telephone number	01923 894888	0870 442 1248	0700 028 5275	08700 711117
Price	£599 (£510 ex VAT)	£599 (£510 ex VAT)	£799 (£680 ex VAT)	£799 (£680 ex VAT)
Warranty	3 years, collect-and-return	1 year back-to-base plus 4 years labour only	1 year on-site	1 year back-to-base plus lifetime labour
Delivery charge	£41	£25	£34	£24

SPECIFICATIONS

Credit card surcharge	None	None	1.5%	None
Proc. type – Speed (MHz)	Duron – 700	Duron – 650	Duron – 750	Duron – 700
System board	Asus A7V	Soltek	Gigabyte GA-7ZM	Microstar K7T Pro
Chipset	VIA Apollo KT133	VIA Apollo KT133	VIA Apollo KT133	VIA Apollo KT133
Memory bus speed (MHz)	133	100	133	133
Available memory (MB)	64	128	64	128
Maximum memory (MB)	1.5GB	1.5GB	1.5GB	1.5GB
Secondary cache (K)	64	64	64	64
Hard drive capacity (GB)	28.6	9.51	19.0	18.9
Hard drive make	Maxtor	Seagate	Fujitsu	Samsung
CD-ROM make – speed	Afreedy – DVD 10x	Samsung – CD 52x	CTX – DVD 8x	Panasonic – DVD 10x
Other drives and devices	Floppy, V90 modem	Floppy, 56K modem	Floppy, AMR V90 modem	Floppy, V90 modem

EXPANDABILITY

ISA Expansion slots – free	0	1 – 1	0	0
PCI Exp slots – free, AGP	5 – 4, 1	5 – 4, 1	3 – 3, 1	6 – 5, 1
Serial ports	2 x 9, 2 x USB	2 x 9, 2 x USB	2 x 9, 2 x USB	2 x 9, 2 x USB
Parallel	1	1	1	1

GRAPHICS SYSTEM

Monitor	ADi E44	Daewoo UB-1536D	CTX PL7	AOC Spectrm 7VLr
quoted diagonal (in)	15	15	17	17
measured diagonal (in)	13.75	14.00	16.00	16.00
dot pitch (mm)	0.28	0.26	0.27	0.27
Video adaptor	nVidia GF2 MX	nVidia Riva TNT2	nVidia GF2 MX	nVidia Riva TNT2
video memory (MB)	32	32	32	32

SOUND

Sound card	VIA PCI Audio	VIA PCI Audio	VIA PCI Audio	VIA PCI Audio
Speakers	Vision 1	Busby 240W	TEAC Powermax 80/2	Tsunami PM2500

EXTRAS

Make of mouse	MS Intellimouse	MS Intellimouse	Logitech Pilot Plus	MS Intellimouse
Operating system	Windows 98 SE	Windows 98 SE	Windows 98 SE	Windows 98 SE
Bundled software	SmartSuite Millennium, DVD/modem/sound utils	SmartSuite Mill, WinFax, AV 2000, Ghost, Virtual Drive CD/modem/sound utils	SmartSuite Millennium, DVD/modem/sound utils	MS Works 2000, DVD/modem/sound utils
BIOS make	Award	Award	Award	Award
Power – Suspend (W)	122 – 128	130 – 55	163 – 89	161 – 53
Faults as supplied	None	DirectX 7 not installed. Trouble waking from suspend	DVD drive wouldn't read some CDs. Faulty floppy drive eject	Wouldn't complete Video 2000

VERDICT

10

7

6

8

THREE PRICE PCs



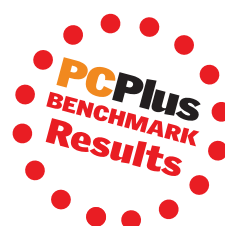
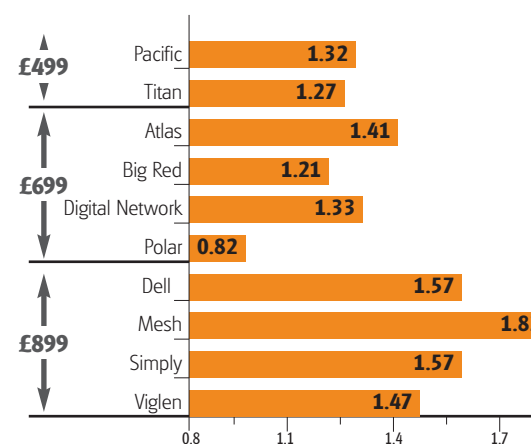
DN100 (J)	Paragon 667	Dimension 4100 866	Matrix 1000GT	Systemax A900RV	HomePro P3 866 DLr
Digital Network	Polar	Dell	Mesh	Simply Computers	Viglen
Direct	Direct	Direct	Direct	Direct	Direct
0870 444 1940	0800 138 1238	0870 907 5667	020 8208 4705	08707 297644	0990 486486
£799 (£680 ex VAT)	£799 (£680 ex VAT)	£999 (£850 ex VAT)	£999 (£850 ex VAT)	£999 (£850 ex VAT)	£999 (£850 ex VAT)
2 years on-site	1 year back-to-base plus 2 years lab only	1 year on-site plus 2 years collect-and-return	1 year on-site plus 2 years back-to-base	1 year back-to-base plus 2 years labour only	1 year on-site
£19	£29	£58	£40	£29	£29
None	3%	None	None	None	None
Athlon – 800	Celeron – 667	Pentium III – 866	Athlon – 1GHz	Athlon – 900	Pentium III – 866
Abit M7VKB	EPoX CU-133A	Dell/Intel E139761	Asus A7V	Abit M7VKB	Intel D815EEA
VIA Apollo KT133	VIA Apollo KT133	Intel 815E	VIA Apollo KT133	VIA Apollo KT133	Intel 815
133	66	133	133	133	133
64	64	64	128	128	128
1.5GB	1.5GB	512	1.5GB	1.5GB	512
256	128	256	256	256	256
19.0	19.0	14.0	19.0	18.9	19.1
Maxtor	IBM	IBM	Fujitsu	Samsung	Western Digital
LG – DVD 10x	Sony – DVD 10x	Samsung – DVD 12x	Pioneer – DVD 16x	Pioneer – DVD 10x	Pioneer – DVD 10x
Floppy 56K modem	Zip 100, Floppy, 56K modem, Epson Stylus Col 480, Flat-bed scanner, Net camera	Floppy	Floppy, Diamond Supra V90 modem	Zip 100, floppy, ATI TV-Wonder, V90 modem, SideWinder gamepad	Floppy, Diamond Supra V90 modem, Intel Ethernet adapter
1	0	0	0	1 – 1	0
5 – 3, 1	5 – 4, 1	5 – 4, 1	5 – 3, 1	5 – 3, 1	5 – 4, 1
2 x 9, 2 x USB	2 x 9, 2 x USB	1 x 9, 2 x USB	2 x 9, 5 x USB	2 x 9, 2 x USB	1 x 9, 2 x USB
1	1	1	1	1	1
Logix LGX172	Hansol 710P	Dell E770P	Hansol 710A	CTX PR705F	Viglen PL7
17	17	17	17	17	17
16.00	16.00	16.00	15.75	16.00	16.00
0.27	0.26	0.27	0.27	0.24	0.27
3D Power GF2 MX	nVidia GF2 MX	nVidia GF2 GTS	3D Prophet II MX	3D Power GF2 MX	Intel 815
32	32	64	32	32	Main mem + 4MB
Creative SB PCI 128	VIA PCI Audio	Creative SB PCI 64	Creative SB 128	VIA PCI Audio	AD1885
Tsunami PM2500	Labtec Spin-50	99NMC	TEAC Powermax 80/2	Creative SBS52	Altec Lans ACS33
4D Optical	Digital	MS Intellimouse	MS Intellimouse	Logitech Pilot Plus	MS Intellimouse
Windows 98 SE	Windows Me	Windows 98SE	Windows 98SE	Windows Me	Windows Me
SmartSuite Mill, ViaVoice, Personal Assistant, Quicken, McAfee AV, DVD/modem/sound utils	Smartsuite Millennium, iPhoto Plus 4, Norton AV, Textbridge, DVD/ Zip/ camera/modem/sound utils	MS Works Suite 2000, DVD/sound utils	MS Works Suite 2000, DVD/modem/sound utils	SmartSuite Mill, Norton Utilities, Unreal Tour, Driver, Rollercoaster, DVD/Zip/modem/ sound utils	MS Works 2000, DVD/modem/sound utils
Award	Award	Intel	Award	Award	Intel
206 – 110	147 – 73	146 – 67	202 – 55	204 – 118	134 – 86
Very slow and jerky 3DMark, USB keyboard problem	None	No Windows CD	Poor mouse connection	Some Video 2000 tests wouldn't display. Couldn't adjust refresh rate	None
6	9	9	8	9	7

PCPlus BENCHMARKS

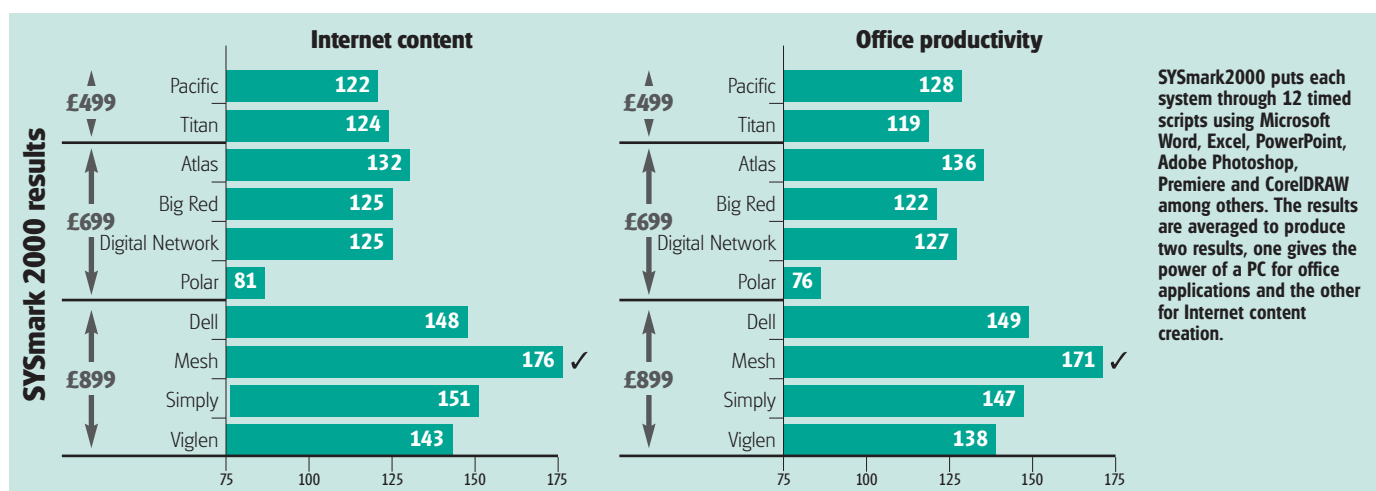
Our benchmark is designed to provide a quick and thorough guide to overall system performance. We test individual aspects of performance.

For full in-depth details on how our benchmarking system works, please visit www.pcplus.co.uk/bench.

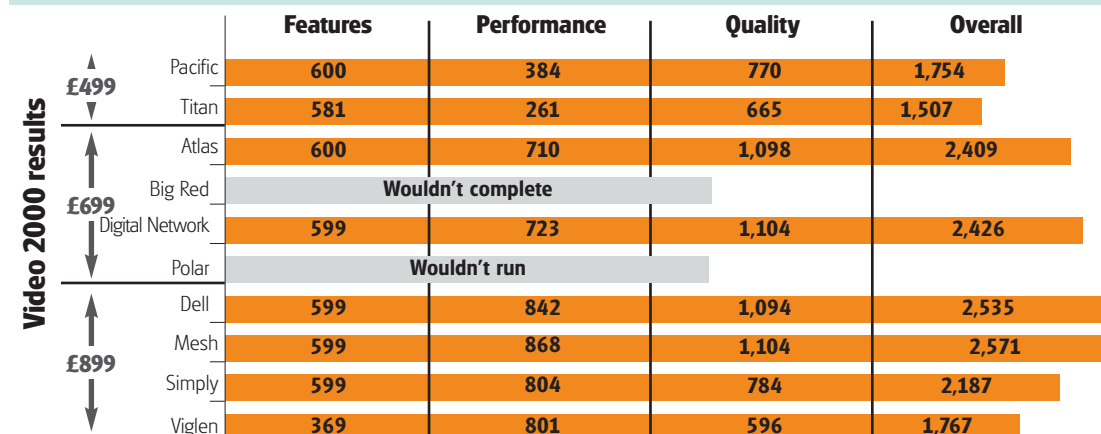
PCPlus Combined benchmark scores



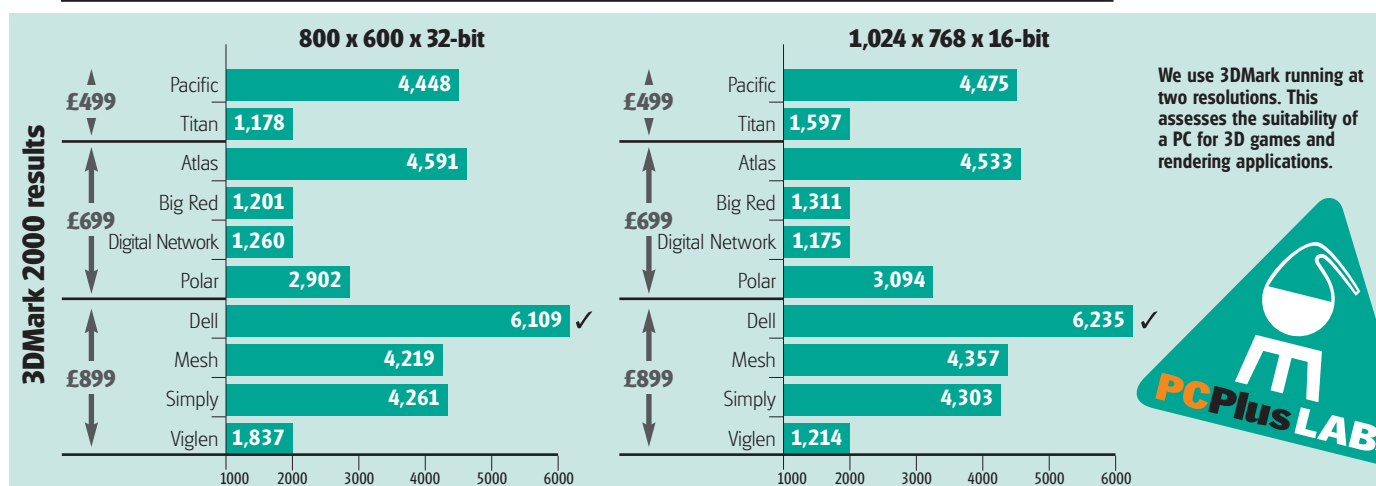
The overall PCPlus benchmark score is an amalgamation of our benchmarks and is indexed against a standard 500MHz Intel Celeron system. This means you can instantly see just how fast any PC system is.



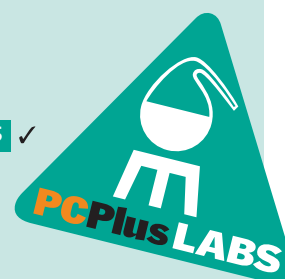
SYSmark2000 puts each system through 12 timed scripts using Microsoft Word, Excel, PowerPoint, Adobe Photoshop, Premiere and CorelDRAW among others. The results are averaged to produce two results, one gives the power of a PC for office applications and the other for Internet content creation.



Video2000 tests the performance of MPEG decompression - this means you get a sense of how good the system is at playing video.



We use 3DMark running at two resolutions. This assesses the suitability of a PC for 3D games and rendering applications.



PCPlus VERDICT

If you pick wisely, you can get a better PC for £500 than some of those costing £700. You can get nearly as good a PC for £700 as you can for £850 and this is where I reckon you should look

Analysis

SIMON SAYS

It's easy to get caught up in the delights of a PC's hardware and lose track of what is actually needed. A couple of years back, there was still the need for bigger hard drives, to store the data that was typically required for day-to-day work. More memory was just as necessary to handle greedy operating systems and the average processor of the day could still make your PC feel sluggish doing everyday jobs, like redrawing a desktop publishing page.

By and large, that's no longer the case. A typical Windows Me system is perfectly happy with 64MB of memory, running on a 600MHz processor, with 10GB of hard drive space. I don't use more than this and I'm probably running more outlandish software than you are.

It's got to the stage where I'm comparing PCs, all of which will do the jobs most people are likely to set them. Even Polar's sluggish Celeron is quick enough. You won't have to go and make the coffee while it scans or prints for you. So am I not writing myself out of a job?

I would humbly suggest that even when the specifications of the hardware are ahead of what the software demands, as now, you still don't want to waste your money. Why buy a PC with a 9.5GB hard drive, when you can get one with a 28.6GB one for the same money. You may not have a need for it today, but it still seems wasteful not to take the best value on offer.

And value isn't just the components in a PC; it's how it's built, too. A machine where care has obviously been taken in the choice of components and in the way they've been put together, is likely to give you fewer reliability problems than one that's been cobbled together from whatever's cheapest this week.

A good PC should be judged on a combination of performance, choice of components, construction and price. This is pretty much what we do in our single PC and group tests – to give an overall picture of the PC and how well it will suit you.

EDITOR'S CHOICE

→ Pacific PC 700 PLUS

PRICE £599 **EX VAT** £510
SUPPLIER Pacific PC
PHONE 01923 894888
ONLINE www.pacificpc.co.uk

There's no reason you shouldn't be able to buy an excellent all-round PC, even if you're on a tight budget. Pacific PC's 700 Plus has just about everything you could want in a good general-purpose machine and a few extras you wouldn't expect in a machine in this price bracket.

There's a huge hard drive for starters, a DVD and a hardware Motorola modem. The processor is a fast Duron and, unusually at the price, it's married to a GeForce2 MX graphics card.

All this means the machine has a good turn of speed, more than sufficient for the main business and leisure programs you're likely to throw at it, perhaps like SmartSuite Millennium, which is bundled. The only

slight cloud is the fuzziness of the ADi monitor at high resolution, but if you stick to 800 by 600, even this objection fades away. Superb value for money with commendable performance.

PCPlus Verdict10/10



BEST VALUE

→ Polar Paragon 667

PRICE £799 **EX VAT** £680
SUPPLIER Polar **PHONE** 0800 138 1238
ONLINE www.polartechnology.com

Another machine that seems excessively cheap for what it is. As well as a neat PC with useful extras like a Zip drive and a DVD, the package includes an Epson inkjet, a reasonable flat-bed scanner and a USB camera. These peripherals also come with their own software, so the accompanying bundle is better than most. The only thing to keep this system from Editor's Choice, is its peculiarly strangled performance. Even with a **PC Plus** Index of just 0.82, though, it's worthy of a Value Award.

PCPlus Verdict9/10



BEST PERFORMER

→ Dell Dimension 4100 866

PRICE £999 **EX VAT** £850
SUPPLIER Dell Computer **PHONE** 0870 907 5667
ONLINE www.dell.com

There're two elements to a fast PC, the performance of its processor and of its graphics adaptor. Dell put an 866MHz Pentium III in its Dimension 4100 866, which means the first of these is taken care of. Although not as breakneck as Mesh's 1GHz Athlon, it comes a good second and is considerably better at graphics thanks to the 64MB GeForce2 GTS card that sits alongside the processor.

It's this combination of fast core speed and ultra fast 3D response which earn the PC a Performance Award.

PCPlus Verdict9/10

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→ Interpolation

Whether it's to improve print quality or fill pixels, use interpolation

When a scan takes place the sensors effectively take a snapshot of one small area of the surface of the scanned image. This little image or pixel is usually box shaped and can have a colour depth dependant on the type of scan. A black and white image will consist of the pixel being either black or white whilst a 24-bit colour image has millions of colours and shades. The size of this pixel designates the maximum image resolution of the scanner. This can be a deceiving as scanner manufacturers often quote resolution figures considerably higher than the physical resolution

that the sensors are capable of achieving. To gain these higher values they use a technique called interpolation. This is a means of intelligently filling in between individual pixels at a higher resolution with dots calculated from the value of the surrounding image. Many printer manufacturers use a similar principle to improve print quality. This process is usually carried out in hardware on the scanner and can have considerable influence on scanner speeds, though some software packages, like Photoshop, can interpolate an image to produce similar results.

In search of the perfect image

Scanners are getting better and better, and cheaper and cheaper. **Paul Warner** rates the best budget models



Not so long ago it was all very simple. You could spend £500 and get a scanner that weighed a ton and produced acceptable results. If you were on a budget then you wouldn't have much choice and would probably end up with a hand scanner. This would grab a narrow band of an image and require a very steady hand. Many graphics packages used 'stitching' techniques to join these bands together in an attempt to create a decent sized image – usually unsuccessfully. In recent years we've seen the introduction of entry-level full size scanners capable of grabbing an A4 image or larger. These have been an improvement over the hand scanner but the really cheap versions have left a lot to be desired. Most of these connected to your PC by doubling up on the parallel port and with both poor drivers and build quality had considerable room for improvement.

As usual, technology improvements tend to soak down through the price bands and we are now seeing mid-range and entry level scanners that are capable of producing exceptional image quality. When an image is scanned, light is reflected off the surface of a source image. In the classic flat bed scanner this is reflected via mirrors through a lens and prism to an array of light sensors. The quality of light source, optical features and sensors all affect the final image and the higher the density of sensors (Charge Coupled Devices or CCDs), the finer the resolution that can be achieved. The high-end scanners today still use this principle and you'll find that all the

major manufacturers produce top of the range models that are considerably thicker and heavier in order to support the quality optics needed for this type of scan.

Many modern scanners use a new technology called Contact Image Sensor (CIS) that integrates several of the scanning functions into the individual component, these have banks of red, green and blue LEDs (Light Emitting Diodes) to produce white light and replace the lenses and mirrors of CCD devices. A single row of sensors can be placed close to the image enabling the scanners to be smaller and lighter and this is the technology behind some of the new ultra slim lightweight scanners that are now available.

High-end scanners still tend to use the CCD technology, as CIS doesn't as yet produce the same quality but it's getting closer. Production costs for CIS scanners are lower and as a result we've seen a move to this style in the mid-range pricing, though many of the really cheap deals are still using the reflective principal but achieve the price by using plastic optics and lower quality components.

Most of the scanners in this round up are capable of hardware resolutions around 600dpi, and for the purpose of our testing, I will use the highest physical resolution available across the range of scanners. I'll record the scanning times for a sample document and attempt to test image quality by comparison of colour rendition to the master, and the ability to resolve increasingly finer line resolutions in both planes.



→ Glossary

Some common scanning terminology

BIT DEPTH

The number of bits used to represent each pixel. The greater the bit depth, the more colours or greyscales can be represented. For example, a 24-bit colour scanner can represent 2 to the 24th power (16.7 million) colours.

CCD

Most scanners use charge-coupled device arrays, which consist of tightly packed rows of light receptors that can detect variations in light intensity and frequency. The quality of the CCD array is probably the single most important factor affecting the quality of the scanner.

DE-SCREENING

The technique of eliminating moiré patterns, or undesirable dot patterns that appear in images scanned directly from magazines.

DPI

Dots Per Inch. A measurement of scanner resolution. The number of pixels a scanner can physically distinguish in each vertical and horizontal inch of an original image. Documents are normally scanned at a resolution of between 200 dpi and 400 dpi.

GAMMA

The contrast affecting the mid-level greys or mid-tones of an image. Adjusting the gamma of an image allows you to change brightness values of the middle range of grey tones without dramatically altering the shadows and highlights.

ISIS

Image and Scanner Interface Standard, an API for the design and development of scanner drivers. ISIS is an alternative to the TWAIN standard, specifically for scanners. The ISIS standard is usually used for Optical Character Recognition (OCR) software.

OCR

Stands for Optical Character Recognition, the process of scanning an image and converting the image into text format.

PIXEL

The basic building block of all images – the smallest box of data that an image sensor can grab. In low-resolution images they are the cause of jagged edges around images.

RESOLUTION

Indicates the number of dots, often measured in dpi, that make up an image on a screen or printer. The larger the number of dots, and thus the higher the resolution, the finer and smoother images can appear when displayed at a given size.

RGB

The colour model in which every colour consists of a varying amount of each of the three colours Red, Green, and Blue.

SCSI

Small Computer Systems Interface, a standard developed in the late 1980s. It lets up to seven SCSI devices be daisy-chained onto a single SCSI bus. The most common standard is SCSI-2, with support for CD-ROMs and scanners.

TWAIN

An image and scanner interface standard for the design and development of scanner drivers. TWAIN is an alternative to the ISIS standard. No one can give a definitive answer as to the acronym but it has been suggested that it stands for 'Technology Without An Interesting Name'.

Buying advice

Higher prices don't always mean higher quality as this group test proves

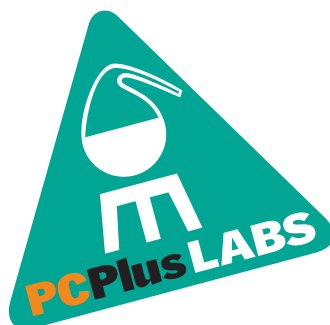
Choosing a scanner may seem pretty straightforward. You've got £100 to spend and you're looking for the best deal. It's not always that simple. The use you're planning to make of your scanner can influence your choice. In our review this month we've got scanners of all sizes and prices. For around £50 you can pick up a reasonable scanner that will grab photos to put on the Web or print out photos. If that's all you plan to do then go for it. However, like most things, once you start you'll find out what you really need.

You may be interested in digital imaging. If you're planning to work with high-resolution images on your PC, then you might need a bit of extra RAM and processing power. Adobe recommends a minimum of 64MB memory for Photoshop. I've found 128MB more useful when working with larger high quality colour scans. If you start looking for high quality images you're going to need a quality scanner that can control image resolution and correct colours. These usually start at around £100 and several in our round up fit the bill. For the avid photographer the ability to scan film is useful. Some scanners have this facility built in but if not, check that

your model can fit a film scanner as an optional extra.

If you're planning to use a scanner across several machines, or between a Mac and a PC, you have several options. SCSI is generally available across both platforms but is expensive especially if you have to add additional cards. USB is now found on most machines and is probably the best compromise. Some scanners still make use of the parallel port and this will always be available on all machines. It's on the slow side and I've often found conflicts with printer and scanner drivers.

Take a close look at the software that comes with any scanner. This can often be worth as much as the scanner. A copy of Photoshop and a good OCR package will make all the difference between two scanners of similar performance and price. Well-known brands may seem a bit more expensive but there'll be the security of mature drivers and a degree of future proofing. Hewlett-Packard still supply historic drivers for all scanners, that can be downloaded from the Web.



1 BUTTONS

The high end scanners can do more than just scan: sending the images straight to print is one added function as is faxing and e-mail. These can all be done using the buttons on the front of the machine.

2 SOFTWARE

Each scanner comes with its own software, which is enough to set up and use the scanner straight away. Extra software can be added to your PC for more advanced results.

3 USB PORT

Scanners are usually connected to PCs via the USB port and installation is straightforward: plug it in, wait for the PC to recognise the scanner and the supplied software should install.

4 SCAN HEAD

The scanner's interface can vary. The more expensive scanners provides film scanning of both slides and 35mm by using added transparency templates.





» A must for the photographer with 5" x 4" film scanning.



» One of the best colour renditions we've ever seen



Acer 1240UT

PRICE £200 **EX VAT** £170 **SUPPLIER** Dabbs
PHONE +31 (499) 750 500 **WWW** www.acerperipherals.nl

If you're into large format photography, this flatbed is the most economical scanner

Acer may not be the first name that comes to mind when you think of scanners but the 1240UT adds to an impressive range. Their ScanPremio ST and film scanner units have been available at the professional end of the market, and this, their latest scanner has managed to integrate flat bed scanning along with film scanning in the same box. They've adopted the same approach as Agfa by inserting the light source for the film unit inside the lid. In Acer's case they've managed to increase the size to handle film stock up to an impressive 5" x 4" and still keep the price down to affordable levels. I've not seen many scanners that can handle this size of film for much under £700.

The scanner connects through a standard USB port on both Mac and PC. If you find your PC hasn't got USB you can pick up a PCI card for around £20. You'll need to be running Windows98, as earlier versions of 95 didn't have USB support. Acer provides a quick start sheet and a comprehensive manual (yes, a real manual) which will get you up and running.

Once you've unlocked the scanner mechanism and powered up Windows, it should detect new hardware and ask for the driver CD. This installs Acer's MiraScan TWAIN driver that controls all the scanning features. You can choose between Reflective or Transparent in the menu and this will switch between

Tested on
Pentium 500MHz with Matrox G400
Extra information
Includes film scanner up to 5"x4"

the standard flat bed scanning and using the built in film scanner.

All these options are available when you select Acquire from any TWAIN compliant software. Acer supplies Uleads PhotoExpress as its main editing software; other packages include FineReader, an excellent OCR package with an option to upgrade to their latest version 4.00. Also included are Page Manager and Copy Software.

This is an impressive scanner; if you're into large format photography then it must be one of the most economical ways to start scanning larger format images (anything larger than 35mm). It may not be as fast as some of the other scanners but still holds its own as a stand-alone flatbed.

PC Plus Verdict

ACER 1240UT

✓ **FOR**
→ Great film scanning capacity

✗ **AGAINST**
→ Not as fast as the best performers

Specification.....10
Quality.....9
Performance.....8
Value for money.....9
OVERALL.....9

Agfa SnapScan E50

PRICE £199 **EX VAT** £169 **SUPPLIER** AGFA
PHONE 0181 231 4906 **WWW** www.agfahome.com

With the ability to scan film, fax and e-mail, the Agfa turns out excellent results

Once again Agfa has just about got it right. The Snapscan E50 is aimed at the top end domestic/Soho (Small office, home office) user and has a feature usually reserved for more expensive scanners. With a clever design, they have integrated a light source in the lid of the scanner. Remove a cover plate and you reveal a strip down the centre of the lid. This aligns with a set of film and transparency templates that fit onto the top of the scanner's glass. One holder will accept slides and the other 35mm film stock.

USB installation is straightforward with Windows recognising the new scanner and the device drivers installing off the CD ROM. The ScanWise software is the core TWAINs scanning interface and this integrates with standard graphics packages to give a comprehensive scanning interface.

At the simplest level, the AGFA can scan into a Word document, e-mail, fax, printer or file. The buttons on the face of the scanner can be configured to start up standard applications directly from the scanner. If you need to send a fax, press the fax button with the document in the scanner and the fax application will start up and enable faxes to be sent.

The software defaults to the recommended resolution for each application but at the advanced level you can control resolution, image size and have full control over image attributes.

Tested on
Pentium 500MHz with Matrox G400
Extra information
Includes built in film scanner

One extra feature that will appeal to the fashion conscious is the colour coordinated replacement lid handle and switch covers. Agfa supplies a selection of snap on covers in different colours. So if you've got a blue Mac you can match your scanner to it.

The scanner has an optical resolution of 1200 x 2400 at 42bit depth. It's not quite as fast as the SCSI model from Epson, but returned high quality results. Agfa supply a selection of software comprising their standard scanning interface, Corel Print Office and the ReadIris OCR package. This is a great all rounder, and with the inclusion of film scanning, it has to be great value for money – nice one, Agfa.

PC Plus Verdict

AGFA SNAPSCAN E50

✓ **FOR**
→ Inclusive film scanner and great software

✗ **AGAINST**
→ Not the fastest

Specification.....10
Quality.....9
Performance.....9
Value for money.....9
OVERALL.....9



» They don't come much slimmer than this

CanoScan N1220U

PRICE £149 **EX VAT** £123 **SUPPLIER** Canon UK
PHONE 0121 6666262 **WWW** www.canon.uk

This ultra slim comes with Arcsoft software for creating multimedia slide shows

This is one of Canon's latest range of ultra slim scanners. It uses the LED method to produce such a slim design and with a minimal power requirement manages to draw its power through the USB connection. This should work fine on a stand alone PC but may cause considerable drain if used on a portable. I would recommend only using it on a portable if you've got your charger plugged in. Power consumption is extremely low, using 2.5 watts in full operation, reducing to 12.5 milliwatts on standby.

Installation is simple, plug in the USB connector, the system will recognise the scanner and ask for the drivers on the CD. Canon supplies a considerable selection of good quality software with their CanoScan. The classic Photoshop, even in the LE version, should satisfy the most discerning user. Add to this Omnipage Pro from Caere to handle any OCR requirements and you won't have too much problem getting scanned documents into a text editor.

The Arcsoft PhotoStudio and PhotoBase software are also included. PhotoStudio enables you to edit and retouch images, stitch them together, convert file formats and create albums. PhotoBase is useful in creating multimedia slide shows incorporating sound, video and text with your images to produce presentations.

The ScanGear Toolbox is at the heart of the scanning process and

Tested on
Pentium 500MHz with Matrox G400

can be used to load images directly into programs, making it very easy to print, fax or e-mail images. Press the start button on the front of the scanner and this brings up the ScanGear toolbar. The preview button will drop you into the TWAIN scanner software.

The default values are fairly normal and should be suitable for general use. You can however adjust image resolution to a maximum of 1200dpi. Be careful, this is OK for small images requiring high detail but a full colour scan at 1200dpi will occupy over 400MB on your hard drive. This won't be of much use if you're using PhotoBase under Windows 98 as it's restricted to a maximum file size of 256MB. This doesn't apply with 2000. An ideal scanner for working on the move.

PCPlus Verdict

CANOSCAN N1220U

✓ FOR

→ Very light and slim

✗ AGAINST

→ Even with low consumption, needs external power on a portable

Specification 8
Quality 8
Performance 8
Value for money 8

OVERALL 8



» Excellent performance from the top range Epson

Epson Perfection 1200S

PRICE £219 **EX VAT** £186 **SUPPLIER** Epson
PHONE 01442 261144 **WWW** www.Epson.com

The Epson is perfect for comprehensive Web design or simply use it as a photocopier

With the quality of output available from the average Epson printer, it's essential that they

need to compliment this reputation with equivalent output performance from their scanners. The Perfection 1200S won't disappoint. This scanner comes in at the top end of our price range at just a few pennies below £200. The most obvious feature that sets it apart from most of the scanners is the method of connection. Epson supplies an Adaptec PCI SCSI card with a standard 25 pin SCSI 'D' connector and cable. If you don't already have a SCSI card in your computer then this one does have the facility for connection of standard 50 way SCSI devices inside your box. Ideal if you need to connect an internal SCSI device like a CD-ROM or tape unit.

Windows recognises the standard Adaptec card and installs the scanner on the SCSI bus. You will need to set the SCSI ID of the scanner to a free number if you've fitted other SCSI devices to your system. Once I had installed the drivers the scanner was up and running in no time. The scanner is suitable for both PC and Mac and I chose to install it on a PC.

The standard TWAIN drivers can be called from any application that supports TWAIN or by pressing the single button on the front of the scanner. You'll have the option of two menus. The easy menu is ideal for standard scanning, it gives

Tested on
Pentium 500MHz with Matrox G400
Extra information
Optional film scanner and document feeder

you a choice of image types and destinations. Choose the advanced menu, and you're into a far more professional interface that enables control over almost everything.

To compliment this, Epson has included a comprehensive selection of software for both the PC and Mac user. This includes a copy of Photoshop LE, always welcome. A copy of Adobe's PageMill is included for Web design. Presto Page Manager will sort out your entire document scanning and filing with TextBridge supplied to convert documents from image to text. Instant Photo Print and Personal Copy programs enable you to produce printed photos in different formats or use your system as a photocopier.

PCPlus Verdict

EPSON PERFECTION 1200S

✓ FOR

→ Very Fast
→ High Quality SCSI scanner

✗ AGAINST

→ Not a lot

Specification 9
Quality 9
Performance 9
Value for money 9

OVERALL 9



» Not as fast as its big brother but still a great scanner

Epson Perfection 640U

PRICE £119 **EX VAT** £101 **SUPPLIER** Epson
PHONE 01442 261144 **WWW** www.epson.com

A reasonably priced scanner with quality results, the Epson Perfection is excellent value for money

This is the second offering from Epson that I've had a chance to look at this month and it's aimed more at the entry-level user than its big brother, the 1200 series. Don't get me wrong, this isn't a cheap scanner and at around £110 performs as well, if not better, than many more expensive alternatives.

The 640U uses a USB interface and separate power supply. Epson have utilised a neat unlocking clamp for the scanner that restricts you from plugging in the power until the clamp is released.

Externally, it's simplistic in design with three buttons on the front. One is the power switch and the other two are direct copy and scan buttons. Also included in the package are the relevant cables, software and a stand. No mention is made of how you're supposed to use the stand as it appears to stack the scanner in the vertical position. Further investigation into the online manual reveals that the scanner can be stored in the vertical position for storage and space saving. Epson advise you to lock the scanner mechanism and not use it in the stored position.

Warm up and pre-scan performance are almost identical to the 1200 but scanning the test image at 600dpi took considerably longer at almost double the time. It is also noticeably noisier than the other Epson scanner when you start scanning.

Output is well up to spec and

Tested on
Pentium 500MHz with Matrox G400

produced high quality results, albeit slower than some of the other scanners. Epson don't supply any add-ons for this unit so you can't get a film unit or document feeder. However, they do supply a good selection of software for both the Mac and PC. This includes the Adobe PhotoDelux and the Epson Smart Panel software with features to Scan to OCR, Application, e-mail and Scan to creativity that offers a range of image manipulation.

If you're looking for a good all-round scanner at the right sort of price, then the 640U will do the job. It has quality of image and the result that we've come to expect of Epson.

It's may not be the fastest of scanners that are featured, but for the price it produces some quality results.

PCPlus Verdict

EPSON PERFECTION 640U

✓ FOR
→ Simple to use and good value

✗ AGAINST
→ Not the fastest and no upgrade path

Specification8
Quality9
Performance9
Value for money9

OVERALL8



» Great Web development software and legendary scanner quality

Hewlett Packard ScanJet 4300C

PRICE £99 **EX VAT** £82 **SUPPLIER** Hewlett Packard
PHONE 0990 474747 **WWW** www.scanjet.hp.com/

Ideal for the home or small business, the HP 4300C is a no nonsense easy-to-use scanner

The ScanJet 4300C from Hewlett-Packard is aimed at a similar market to the Epson 640U and comes in at a marginally cheaper price. It's a no nonsense scanner with connection to both parallel and USB ports and so would be ideal if your computer is pre-USB.

Installation is simple with drivers and software supplied on one CD. HP has taken to using a broadsheet installation manual. It supplies the fundamental steps required to set up and run the scanner. If you need to find out anything technical then you have to consult the electronic manuals supplied on the CD. I tried to find the weight of the scanner and ended up using the kitchen scales in desperation. It is still nice to have a proper manual!

Installation is uncomplicated and sets up HP Precision Scan as the TWAIN driver enabling any compliant application to use it. This is a sophisticated interface which gives control over the final output. You can select destination, output type and size. Select the tools option and this gives you more control over resolution and image. One nice feature that's becoming more common on this type of scanner is the linking of control buttons on the scanner to the control software. Press the Scan button on the scanner and up pops the Precision Scan software. Press the copy button and output is sent directly to the default printer.

Tested on
Pentium 500MHz with Matrox G400

HP supplies a selection of software as well as the drivers on CD. These include the Trellix Web design program, Adobe's Active Share and the superb Corel PrintHouse 2000, that should have you up and producing everything from cards to invoices in no time at all. Image quality was well up to the standard we've come to expect from HP. It's a bit quicker than the equivalent Epson 640U but takes a little longer to warm up.

This is a well-built scanner with a reliable TWAIN interface and both parallel and USB interfaces. The real bonus comes with the inclusion of Corel's Print House software, a welcome addition to a no nonsense scanner

An ideal scanner for home or small business, especially if you're planning any Web development.

PCPlus Verdict

HP SCANJET 4300C

✓ FOR
→ No nonsense scanner with HP quality and good software

✗ AGAINST
→ Documentation leaves much to be desired

Specification9
Quality9
Performance8
Value for money9

OVERALL8



» Big is beautiful and a fourteen inch scan.



» It may be the cheapest of the bunch but still turns in a good scan



Microtek Scanmaker x 12 USL

PRICE £234 **EX VAT** £199 **SUPPLIER** Microtek
PHONE 01782 753366 **WWW** www.microtek.com

The Microtek proves that the best things don't necessarily come in small packages

In common with most Scanmaker products, this is a beast. It weighs in at over 12 pounds, making it the heaviest scanner in the whole review. This is not a criticism as the weight reflects the overall build quality of the scanner. Considering this extra weight it returned some surprisingly nimble results. The time to scan our test document at 150dpi is 17 seconds, comparable with the speedy Epson 1200S, though not as quiet.

Connection to your PC is available through either USB or SCSI. This is the only scanner to offer this range of connectivity and does make it suitable for use by a small business with several machines. You could have your main connection use the SCSI port and connect to portables with the USB. I chose to test it on the USB connection, this was simple to install, though the scanner does produce marginally faster results using a SCSI connection.

Microtek supplies an Advansys SCSI adaptor card and connection: this is just for the scanner, it doesn't have an internal connector for other devices like CDs. You could always daisy chain other SCSI devices on the same bus as the scanner.

Version 5 of the ScanWizard TWAIN software will launch from any compliant application when you acquire an image. This uses a different interface to previous version that I've used. It has both a simple and advanced interface.

Tested on
Pentium 500MHz with Matrox G400
Extra information
Optional film and document feed units

Microtek claim that the simple interface is designed for Neophyte scanner users who just want a quick scan with minimum fuss (I think they mean new user). This will give you simple options to scan, copy and e-mail. These options are also available from a set of shortcut buttons available on the desktop. Enter the advanced menu and you end up with a choice to set up resolution and image control.

In an attempt to make the interface more user friendly, Microtek has lost some of the more obvious features found in previous versions. They're still there but buried. A good, quick workhorse that won't disappoint.

PCPlus Verdict

MICROTEK SCANMAKER X 12 USL

✓ FOR
→ Solid scanner with great connectivity

✗ AGAINST
→ A bit on the noisy side

Specification8
Quality8
Performance9
Value for money8
OVERALL9

TRUST Compact Scan USB 19200

PRICE £50 **EX VAT** £42 **SUPPLIER** TRUST **PHONE** 01376 514633
WWW www.trust.com **E-MAIL** trustuk@globalnet.co.uk

An excellent value scanner with a good selection of software - perfect as a first scanner

Trust doesn't make many pretentious claims about this scanner, other than the claimed 19200 resolution. This level would only be applicable for small images that need extensive enlargement and to work at this sort of resolution would require vast amounts of memory and hard drive space. I did try scanning a small section of an image at this resolution; it was over 40MB in size and not particularly successful. Looks good on the side of the box.

It is part of their range of good value equipment aimed at the home market. At this sort of price no one is complaining that it's not quite as fast as the best performers. It is the perfect scanner for first time users who aren't sure what their scanning needs are. It doesn't have the same graphics punch like the Epson or Agfa. However, it is capable of producing acceptable results for the average home/small business user and as such is worthy of being included in the same review.

The scanner is powered by the USB connection. Provided you haven't got too many devices hanging on your USB port this should be okay. If you're worried it is possible to buy a simple USB hub with an independent power supply and this certainly makes plugging things in a lot easier.

Installation is just a question of plugging it in when your PC is running. Windows senses a new USB device and installs the drivers

Tested on
Pentium 500MHz with Matrox G400

off the CD. These come on one CD along with Textbridge Classic, the cut down version of Textbridge Pro, an excellent OCR package.

The other software package is Photo Express version 2 from Ulead. The TWAIN interface is very capable and gives a wide range of scanner control with separate tabs for the TWAIN settings, image enhancement, filters and a batch scan dialogue box. Not bad for under 50 quid.

The Compact Scan won't win any awards for the greatest scanner ever built but, if you're looking for a value scanner that will deliver the goods, has a reasonable selection of software and doesn't set you back too much, then this has got to be worth consideration.

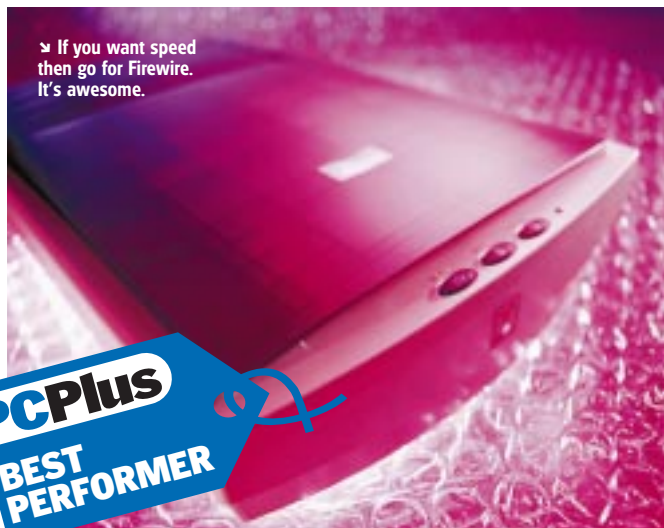
PCPlus Verdict

TRUST COMPACT SCAN USB 19200

✓ FOR
→ Great value

✗ AGAINST
→ Not the best image quality

Specification7
Quality7
Performance7
Value for money10
OVERALL8



» If you want speed then go for Firewire. It's awesome.



UMAX Astra 6400

PRICE £199 **EX VAT** £169 **SUPPLIER** Umax
PHONE 01344 871340 **WWW** www.umax-europe.com

Connected via Firewire, the Umax is a top performer with excellent software inclusions

This is a first for me and could well herald a new generation of connectivity in PC peripherals. The 6400

connects to your PC using a Firewire connection. This has been common on the Mac for some time and, though similar in appearance to USB, offers considerably faster performance. The next generation of USB has been kicking around waiting for final ratification and in the mean time we've started to see more and more kit becoming available for Firewire. Some of the motherboard manufacturers are now starting to fit connectors alongside their existing USB sockets. Installation requires the Firewire card to be fitted in a spare PCI slot and the drivers installed off the CD. There are three sockets on the card so you'll have room to plug in a DV camera or extra Firewire device.

Once the card is up and running the port recognises the scanner as a new device and drivers are installed off the CD. This is a fast scanner, the standard preview time is comparable with most of the quicker scanners but give it a real job to do and it's leaps ahead. A 600dpi image scanned in at 35 seconds, the nearest any of the others managed was just over a minute.

I must assume that this unit is hot off the production line as the manual is pretty sparse. It covers most of the installation and

Tested on
Pentium 500MHz with Matrox G400
Extra information
Comes with a Firewire card

software but doesn't go into much depth concerning each individual program. The basic TWAIN software appears simple enough and has most of the standard adjustments; This links in with Prestos Page Manager software, a useful image cataloguing and distribution application that can be tailored to work with any graphics or text application already installed.

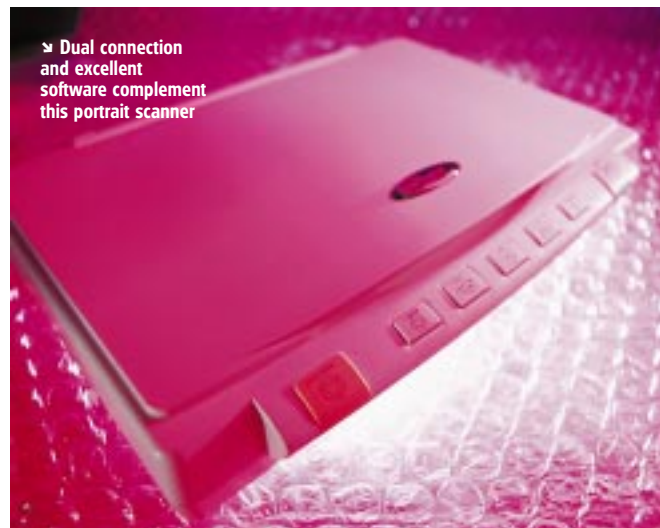
Other inclusions are copy software so that you can scan directly to printer, Page Maker version 5 LE and version five of Omnipage OCR software. This is a useful selection that complements this excellent scanner. If UMAX get some decent documentation together, they could have a sure fire winner on their hands.

PCPlus Verdict

UMAX ASTRA 6400

✓ FOR
→ Very fast especially with heavyweight scans
✗ AGAINST
→ Poor (pre release) documentation

Specification9
Quality9
Performance10
Value for money8
OVERALL9



» Dual connection and excellent software complement this portrait scanner

Visioneer One Touch 8600

PRICE £130 **EX VAT** £121 **SUPPLIER** Visioneer
PHONE 0891 633407 **WWW** www.visioneer.com

The unique landscape layout and One Touch facility stands out from the crowd

The first thing you notice when you unpack this scanner is its orientation. Unlike all the other scanners in this review the One Touch has a landscape layout. The hinge for the lid is along the long side and the front of the scanner has a vast array of buttons along the opposite face. I don't know why more manufacturers don't adopt this format, as it is much easier to use. You don't end up with a long lid flapping around while you're trying to insert a document.

It comes with both USB and parallel port connections. Useful if your PC is pre-USB. Installation is uncomplicated, Windows recognises the new device and you install the drivers off CD. In use the scanner is fast with a 13 second preview time and one of the fastest scans at 600dpi, though not as quick as the Firewire scanner. For the 150dpi colour scan it came in a little behind the Epson 1200 at 12 seconds.

If you're into buttons then you'll love this scanner. A selection of five scanner buttons enables you to send a scan to printer, fax, OCR, e-mail or custom application. Each one can be set up under software and the custom button can be set to any image processing application that you've already installed on your system. One touch and you're straight into Photoshop. All this can be done through the standard TWAIN driver and their PaperPort software.

Tested on
Pentium 500MHz with Matrox G400

For convenience you have the option to use a set of on screen shortcut buttons that mirror the scanner buttons.

Output quality showed great resolution but did lack something in the colour rendition. It may be that all the others are a bit glitzy but by comparison the colours looked lacklustre. They may be just subtler than the others, but it is very much a question of individual taste.

The more I used this scanner the more I grew to like it. The novel approach of landscape scanning and simple buttons does make it very easy to use.

Build quality is high and image resolution very clear which makes the Visioneer One Touch a fast all round scanner at an extremely reasonable price.

PCPlus Verdict

VISIONEER ONE TOUCH 8600

✓ FOR
→ Fast and easy to use
→ Great buttons
✗ AGAINST
→ Not the best image quality in this review

Specification9
Quality9
Performance8
Value for money9
OVERALL9

→ Scanners head-to-head

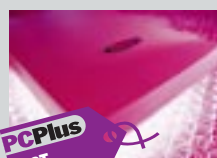
With a wide range of prices and software additions, there is a perfect scanner for every PC



CONTACTS

Manufacturer	ACER	AGFA	CANON	EPSON	EPSON
Model	1240UT	Snapscan E50	CanoScan N1220U	Perfection 1200S	Perfection 640U
Distributor	Acer	Agfa	Canon	Epson	Epson
Type	Flatbed and film scanner	Flatbed and Film combined	Ultra Slim Flatbed	Flatbed with transparency and document feed option	Flatbed
Tel No	+31 (499) 750 500	0181 231 4906	0121 6666262	01442 261144	01442 261144
Price	£170 / £200	£169 / £199	£123 / £149	£169.99 / £199.74	£92.99 / £109.26
Web	www.acerperipherals.nl	www.agfahome.com	www.canon.uk	www.epson.com	www.epson.com
Max. Scanning Area in inches	8.5 x 11.7 & 5 x4 film	8.5 x 11.7	8.5 x 11.7	8.5 x 11.7	8.5 x 11.7
Max. Optical Res. dpi	1200	1200 x 2400	1200 x 2400	1200 x 2400	600 x 2400
Max. Interpolated Res. dpi	19200	9600	9600	9600	9600
Colour Depth	48bit (3x16)	42bit (3x14)	42bit (3x14)	36 bit (3x12)	36 bit (3x12)
Connection	USB	USB	USB includes power	SCSI card provided	USB
Pre Scan time	19 sec	28 sec	18 sec	8 sec	8 sec
Time to scan test doc. 600dpi	2 min 21 sec	1 min 42 sec	1min 22 sec	1 min 43 sec	3 min 21 sec
Time to scan test doc. 150dpi	41 sec	31 sec	22 sec	17 sec	18 sec
Transparency/document	Includes built in film scanner	Includes built in film scanner	None	Optional extra	None
Software supplied	Ulead PhotoExpress, Finereader OCR, Page manager and copier.	Agfa Scanwise, Corel Print Office and Readiris Pro	Photoshop 5.00 LE, Photobase, Omnipage Pro, Photostudio 2000	Photoshop5 LE, Adobe PageMill, Presto Page Manager, Textbridge Classic Epson PhotoPrint and Personal Copy	Adobe PhotoDeluxe ver4, . Epson Smart Panel including Scan to OCR, to email, to Application and Scan to Creativity
Dimensions mm	460 x 305 x 118	496 x 337 x 94	256 x 372 x 34	287 x 427 x 90	269 x 435 x 93
Weight in lb	9.5	9.24	3.3	9.9	6.2

VERDICT



CONTACTS

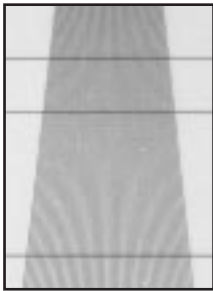
Manufacturer	HEWLETT PACKARD	MICROTEK	TRUST	UMAX	VISIONEER
Model	Scanjet 4300C	Scanmaker x 12 USL	Compact Scan USB 19200	Astra 6400	One Touch 8600
Distributor	HP	Microtek	Trust	Umax	Visioneer
Type	Flatbed	Flatbed	Flatbed	Flatbed	Flatbed
Tel No	0990 474747	01782 753366	01376 514633	01344 871340	0891 633407
Price	£82 / £99	£199 / £234	£41 / £50	£170 / £199	£107 / £130
Web	www.scanjet.hp.com	www.microtek.com	www.trust.com	www.umax-europe.com	www.visioneer.com
Max. Scanning Area in inches	8.5 x 11.7	8.5 x 14	8.5 x 11.7	8.5 x 11.7	8.5 x 11.7
Max. Optical Res. dpi	1200 x 2400	1200 x 2400	600 x 1200	600 x 1200	600 x 1200
Max. Interpolated Res. dpi	9600	9600	19200	9600	9600
Colour Depth	36 bit (3x12)	42 bit (3 x 14)	48	42 bit (3 x 14)	36 bit (3 x 12)
Connection	USB and Parallel	USB and SCSI	USB	Firewire	USB and Parallel
Pre Scan time	21 sec	20 sec	32 sec	13 sec	13 sec
Time to scan test doc. 600dpi	1 min 43 sec	57 sec	1 min 46 sec	35 sec	1 min 2 sec
Time to scan test doc. 150dpi	19 sec (prescan warms lamp)	17 sec	49 sec	15 sec	12 sec
Transparency/document	Optional extra	Optional Extra	None	Pending	None
Software supplied	HP Precision Scan LTX, Corel Print House 2000, Adobe Active Share and Trellix Web Design	Adobe Photoshop 5 LE, Caere Pagekeeper, Caere OmniPage, Microtek Scanwizard	TWAIN driver and TextBridge Classic, Ulead PhotoExpress	Vista Scan, Vista Shuttle, Page Manager, Omnipage 5.1, Recognita and Photoshop 5 LE	Paperport suit and MGI Photosuite II
Dimensions mm	490 x 310 x 85	545 x 302 x 70	415 x 264 x 1	460 x 310 x 90	440 x 290 x 85
Weight in lb	7	12.1	70	75	5.7

VERDICT

→ Scanners put to the test

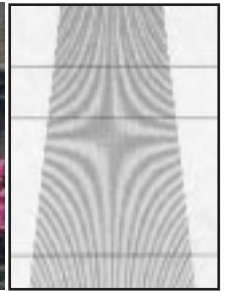
The same print was used to test the quality of each scanner, these are the results

Acer 1240UT



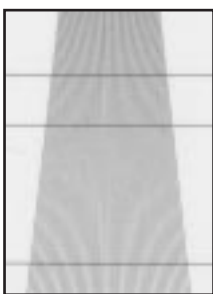
↑ Fantastic for large format photography. It's a bit slower than other scanners, but it produced reasonable results

Agfa SnapScan E50



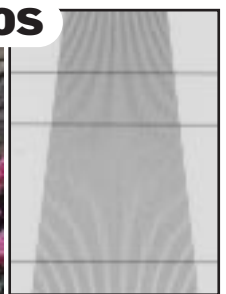
↑ With the built-in film scanner, this is a great performer producing high quality scans, but not the fastest of the bunch

CanoScan N1220U



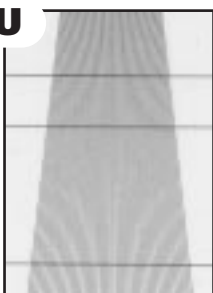
↑ With PhotoShop and ArcSoft's PhotoStudio and PhotoBase, this is perfect for creating multimedia presentations with its clear scans

Epson Perfection 1200S



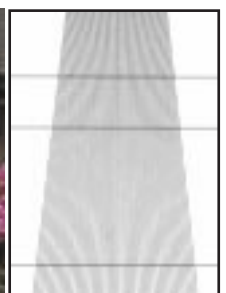
↑ A very fast, high quality scanner with high quality clear results, it's almost perfection

Epson Perfection 640U



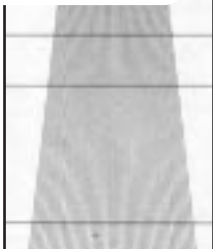
↑ A simple-to-use good value scanner. Produces quality results but slower than its big brother

HP ScanJet 4300C



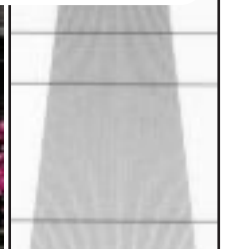
↑ A no nonsense scanner with the expected HP quality and a wide selection of software

Microtek Scanmaker x 12 USL



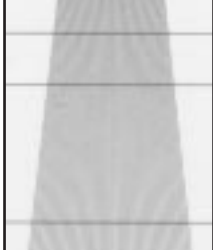
↑ A big machine with big results, a standard 14-inch scan, this produces the largest scans on test

TRUST Compact Scan USB 19200



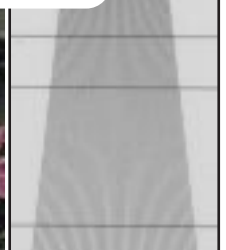
↑ The cheapest scanner on test and great value for money. Not the best of results, but perfect for the beginner - and it won't break the bank

UMAX Astra 6400



↑ A very fast scanner which produced excellent results. Installed via Firewire connection - a top performer

Visioneer One Touch 8600



↑ Fast and easy-to-use scanner with one touch facility, great functions but not the greatest of scans

PCPlus VERDICT

Ten high quality scanners have been put through their paces and the best three have been chosen. So, which is the scanner for you? The best options are revealed below

Analysis

SCANNED IMAGE SIZES

Does size really matter?
When it comes to dpi,
it's questionable

We don't plan to bring you any dummies when it comes to our group test selection and any one of these scanners will give you satisfactory results. Whether you're looking to find a cheap scanner for home use, something a bit more special for Soho (small office home office) applications, a scanner with film imaging facilities or perhaps something with expansion capabilities, then you should find something to suit you in this bunch.

Some manufacturers do get carried away with their maximum scanning resolution and we've found that anything quoted above 9600 dpi is a bit questionable. The true optical resolution is a better guide to performance and this usually ranges between 600 and 1200 dpi. For the average scan anything in excess of 300dpi starts to get a bit unwieldy unless the image size is small. I tested our standard document at 600dpi to get an assessment of performance at this level and resolution file sizes were in excess of 100MB. If you are into enlarging documents or high-resolution film scans and intend to work at the higher end, then invest in some more RAM. Programs like Photoshop do have the ability to page an image so that the section you're working on is held in RAM but get the whole image in memory and you'll work a lot faster.



↓ By keeping the whole image in memory, you'll be able to work faster

EDITOR'S CHOICE

→ Agfa SnapScan E50

PRICE £198 EX VAT £168

SUPPLIER AGFA

PHONE 0181 231 4906

WWW www.agfahome.com

This is a difficult one and by definition very personal. Many of these scanners are capable of similar resolution and some can even manage to scan the image much faster than their competitors. I try to be objective in this area and balance all the relative merits of quality, software and performance. With a background in photography I tend to place an emphasis on image quality and faithful colour rendering. To this end it came down to a couple of scanners, both fitted with film scanning units in the scanner cover. The Acer scanner has the greater film capacity but is not quite as quick as the Agfa. It may only handle 35mm film and slides



PCPlus
EDITOR'S
CHOICE

but for amazing colour quality I would choose the Agfa E50 as the one to take home with me.

PCPlus Verdict9/10



PCPlus
BEST
VALUE

BEST VALUE

→ TRUST Compact Scan USB 19200

PRICE £53 EX VAT £45 SUPPLIER TRUST

PHONE 01376 514633 WWW www.trust.com

The Trust scanner is a great price for a well-known brand name and this is a safe choice. However, it may not have all the bells and whistles of some of the others. It's a simple USB scanner that does its job well. Image quality is good enough for average use and it's not that much slower than the others. Add to this a reasonable selection of software and at about £50 you'd be hard pressed to purchase the software. It has to take our value award - if you're after an introduction to scanning, you can't go far wrong.

PCPlus Verdict8/10



PCPlus
BEST
PERFORMER

BEST PERFORMER

→ UMAX Astra 6400

PRICE £199 EX VAT £169 SUPPLIER Umax

PHONE 01344 871340 WWW www.umax-europe.com

In past reviews it's usually been a choice between Epson and HP for the best performer. Both offerings from these companies performed well and in the lower scan resolutions Epson saw everybody off except one with their 1200S. Start to get a bit serious about resolutions and file sizes, then things change. The use of a Firewire connection transforms the speed of the UMAX Astra6400, making it almost twice as quick as any other scanner in the group. Add to this a quality scan and this has to take our performance award.

PCPlus Verdict9/10

E-COMMERCE

+

+

Build your own Web Shop

Opening-up shop on the Web has never been simpler, **Tim Woodward** investigates the DIY approach to easy e-commerce

Once upon a time building an e-commerce Web site would have been a job best left to the professionals, unless of course you happened to be an expert in HTML, with maybe a smattering of experience in active server page back-end database programming. Thankfully times have changed, e-commerce is now such a main stream activity we can take advantage of fourth and even fifth generation Internet shop building software – much of it aimed at the first time user with little or no Web experience.

In this feature I'll be looking at a variety of cost effective DIY Web shop solutions, from local PC-based catalogue

creation tools, to ASP-type dial-up shop provision – all of which will make the process of taking your business online as painless as possible. I'll also be examining the framework you need to put in place when preparing your shop, and just what is involved in getting your e-business up and running. Before we delve into the shop building products themselves, then, let's take a look at the way e-commerce works and what you might expect from your software.

Taking the money

First things first. There is very little point opening up shop on the Web, only to have no means of receiving payments from your customers. The driving force behind the Internet shopping revolution has been the convenience of the credit card, so if you want to sell on the Net, you will need to accept credit cards.

Of course, for the established trader the building blocks for processing 'customer not present' credit card transactions may well be in place. For the

start-up business, however, things are not so easy. Getting a credit card merchant account from your new bank can be a nightmare, and this is often stated as the main reason why most Internet start-up ventures don't make it off the ground.

If you do already have a merchant account, then most e-commerce software will enable you to receive your orders with the credit card details attached – these can then be processed manually as you would any mail order transaction. Orders should be encrypted for security reasons, and some software also offers more direct gateways to online payment authorisation bureaus.

In effect, these organisations act as yet another merchant facility, dealing with the electronic bit concerning the verification that the cardholder has funds to pay for the goods. Everything should be done in real-time and the order is shipped to you with payment confirmed. You as the merchant don't ever see the credit card details, thereby avoiding any possible accusations of fraudulent use.

These facilities don't come free, so you can expect to pay a set-up fee and a percentage of each sale to your own bank for the merchant facility – plus a similar arrangement for the online facility.

→ The Dreaded VAT

How to calculate VAT

Have you noticed how many major Internet retailers apply a sledgehammer approach when it comes to VAT. It's surprising how many UK sites you can go to which include VAT in all the prices, and often delivery charges as well – you simply don't get a choice.

If your e-commerce software does its job properly, it should calculate tax according to a set of rules required for applying VAT inside the UK, outside the UK but within the EU and outside both the UK and the EU. In short, the software should levy tax according to where the recipient lives and will take delivery of the goods, and in some cases whether they are registered for VAT or not.

If your software doesn't apply these rules automatically, you should at least be able to set-up enough tax rates and

locations to allow the customer to pick their own situation. In brief, the typical scenarios are outlined below:

→ If the customer is based in the EU, and is not registered for VAT, then treatment is just the same as if they were a UK sale. That is, they are charged UK VAT on goods as normal.

→ If the customer is a business based in the EU, and registered for VAT, then they can be charged a VAT-exclusive price. Your software should take their VAT registration number for reference.

→ Once the customer is outside the UK and EU (that is the rest of the world), the job is easier as all goods exported outside the EU, regardless of whether the customer is trade, retail, registered or unregistered, are VAT free.

Sometimes your online bureau can open a merchant account with themselves, and these are often easier to establish than with the conventional banks – high street banks are still incredibly slow and pedantic about Internet trading.

Feeling secure

Organising a merchant account, and sorting out the online payment gateway gets the first hurdle out of the way. Next you need to think about some of the other ramifications of trading on the Internet. All good Web shop software will feature a means of displaying your terms

and conditions, for instance, so it's a good idea to get a legal eagle to make sure these apply to the prospect of global Internet trading as well as UK law.

If you open shop on the Web you really should expect to receive orders from overseas, and if you want to accept these then you need to think hard about where from – some eastern European and mid-African countries are still thought of as no-go areas. Credit card crime is rife in these locations, and in a fraud situation that nice authorisation number from your bank doesn't mean a thing I'm afraid.

If the cardholder has not sanctioned the use of their card, then you will doubtless be on the receiving end of a chargeback from the credit card company. To make matters worse the thief will probably already have your goods by the time you find out, and not only that, but you risk losing your merchant account if it happens too often.

The answer is to pick who you intend to trade with carefully, and your software should help you with this by enabling you to set-up preferred locations and destinations. Security for the customer is also important, of course, so make sure your shop builder can at least implement SSL (secure socket layer) at the checkout stage.

Delivering the goods

Most e-commerce software will need to know how much you want to charge for delivery to certain locations, and some even offer the facility to interface with a file from your delivery company. All the major carriers will be able to provide you with full cost calculations based on weight and location, and if you are trading overseas they will also be able to help you with foreign customs legislation and the like.

Your shop should also offer customisable tax rates and ideally the software should be able to decide who gets charged tax and when (see our panel The Dreaded VAT for help here). Some software skirts the issue of VAT altogether, but that means you are left charging tax on everything to everybody – which isn't fair or correct.

Finally, in readiness for the process of creating your shop, you should be compiling material on your company – most software will offer various information and contact pages for the Web site as well as a product catalogue. If you have a brochure already you will probably have most of the information to hand, otherwise it's a case of gathering together marketing statements, details such as product images, item descriptions, prices and options. The more you have ready when your shop building software fires-up, the quicker you will get the job done.

Compared to the process of creating a bricks and mortar shopping experience, there is no doubt opening-up shop on the Web can be an extremely easy, quick and very cost effective way to market your wares. In fact, if you don't have too many products to sell, in a few hours of deciding on your chosen route you could be trading on the Web.

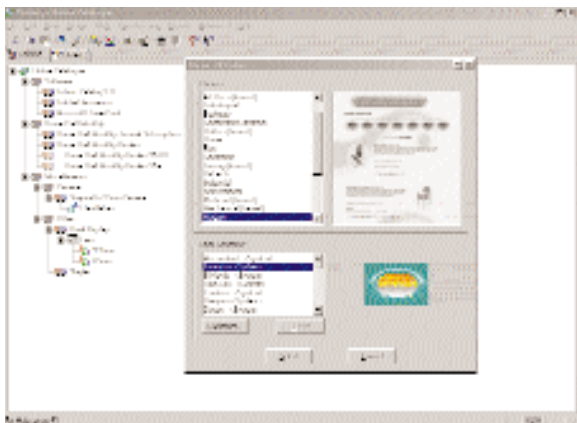
Best tools for the job

Which software option you actually choose for your e-commerce venture, will largely depend on the complexity of your operation and the flexibility you require. Designing your shop on-line can have the disadvantage of call charges to your Internet service provider, but there are no up-front costs at all and you can access your shop from any Web browser on any computer.

Off-line desktop development can certainly be a sophisticated affair, but the software costs more to buy in the first place. Hosting costs can also be lower with off-line catalogue builders, as you can upload your site just about anywhere – whereas the 'per product' shop rent charged by on-line shop providers can be prohibitive for low item cost high volume retailers.

Over the following pages we look at the two most prevalent ways to create your Web shop, on-line ASP type shop providers from the likes of Web Street and NTL ShopBuilder, and off-line desktop catalogue builders from Actinic and ecBuilder Pro.

We also take a look at ShopFactory, a catalogue builder that is just as much fun for the developer as it is the end user, plus something a little more hands-on from Virtual Internet. SnapSell can add on 'buy now' buttons to your existing marketing site if you have one. Regardless of which route you eventually choose, there's no doubt DIY e-commerce has never been quicker, cheaper or easier. **PCP**



Actinic Catalog V4

PRICE £410 **EX VAT** £349 **SUPPLIER** Actinic
PHONE 01932 871000 **ONLINE** www.actinic.co.uk

New UK specific tax handling keeps the market leader in front

If you are looking for off-line desktop PC-based shop builders Actinic Catalog is a good place to start. It's long been a frontrunner, popular with designers and end users alike, and it's UK-based and knows all about VAT.

Although Actinic has plenty of Web designers on the books, Catalog 4 is aimed at those who need to create a one off e-commerce Web site for their business.

Requirements

Pentium PC or higher with 32MB RAM, 60MB free hard drive space, Win95/98/2000 NT 4.0 or higher

Tested on

Intel Pentium II 350MHz with 128MB RAM running Win98

The layout of the design interface is based around a tree display of your shop departments and products, so you can click items you want to edit or copy, or use the drop-down menu to set shop parameters and overall defaults.

In typical catalogue building fashion, the software offers simple-to-complete forms and dialogs for adding features and shop items – like the page layout principles of products like FrontPage. Item details are comprehensive, and features extra product attributes and options. This means you can make products

from other stock items, as well as cater for multiple options such as colour and size. Catalog installs on the local hard drive, and the final e-commerce site is output as pre-built HTML pages – search engine friendly and no back-end databases to worry about. You can accept payment in a variety of formats: cash on delivery, cheque on delivery and so on, and you can also opt to accept credit cards with online authorisation gateways to WorldPay, Netbanx and Datacash among others.

A great deal of work has gone into the VAT facilities, so Actinic Catalog 4 now allows tax to be charged according to the location of the customer. You can also allow for tax exception situations and display the cost in Euros – even charging delivery VAT on a pro rata basis.

The usual company details are asked for, along with business classification for search engine submission from the Multiactive Web site. Unusually, you also get up to 100 user defined pages for other content, such as marketing messages, terms and conditions and so on. Just like Actinic the end result is a nice and simple set of HTML pages output for upload, rather than a database with ASP links – so your choice of host is pretty much universal.

Product design layouts for various industry types can add very specific options to the basic item template.

COD and cheque with order, along with the usual set of credit cards can be taken as payment in your ecBuilder shop, plus the software now offers up to five payment gateways – Cardservice, ClickPay, E-xact, InternetSecure and PsiGate – a definite US bias here I think.

Full order processing is built-in, again complete with Multiactive's own encryption. Unusually the ecOrderDesk software concerned also provides an interface for refunds, pre-authorisations and so on from the on-line authorisation provider – very handy.

Individual department layouts and product options are catered for according to what type of industry the user is in, so you get a choice of product templates for each section. Although only five styles are offered, the generic and retail options cater for just about any kind of e-commerce

The software arrives with a full order processing system included, and orders are downloaded using Actinic's own 128-bit encryption. This latest release caters for backorders, and the stock quantity monitoring now means you can suspend customer ordering of out of stock products – giving a glimpse of the features found in far more expensive installations.

For those with an eye on design, there are plenty of themes available; you can change selected text colour and background design, and power users can still edit the actual templates used to create the final Web pages. You can now upgrade to Actinic Business as well, if you need to cater for customer log-ons and price discounts. Actinic Catalog is comprehensive, not too difficult to use and definitely the catalogue builder to beat at this price level.

PCPlus Verdict

ACTINIC CATALOG V4

✓ FOR

→ Product options, template editing and good UK tax handling

✗ AGAINST

→ Can look a little expensive compared to some

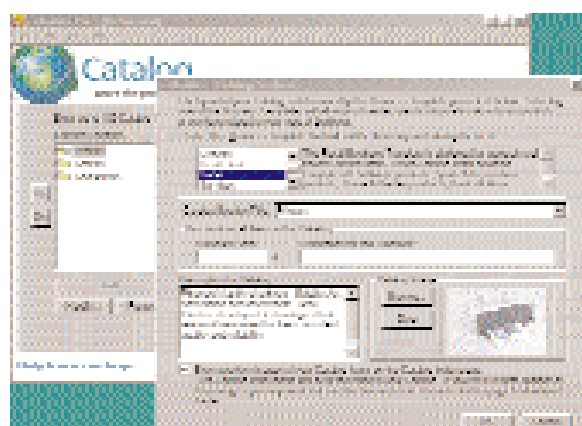
Specifications8

Quality9

Performance8

Value for money7

OVERALL8



ecBuilder Pro V5

PRICE £147 **EX VAT** £125 **SUPPLIER** Multiactive
PHONE 01628 587 777 **ONLINE** www.multiactive.co.uk

Wizards, simplicity and a major price fall make ecBuilder Pro an attractive proposition

Taking an intuitive approach to desktop catalogue building, ecBuilder Pro uses a wizard-based system, again using forms and dialogs like Actinic for ease of use. Each screen of the wizard asks specific questions that go towards building your Web site – you can also jump to the screen of your choice if you know where you want to go.

Requirements

Pentium PC or higher with 32MB RAM, 60MB free hard drive space, Win95/98/2000 NT 4.0 or higher

Tested on

Intel Pentium II 350MHz with 128MB RAM running Win98

venture, while the extra functionality of specific models such as Real Estate Marketing or Automobile Sales is welcome.

More than 40 themes deal with the look and layout of the eventual site, and you can play with colours for all the major parts of a page – no template editing from within the software though.

ecBuilder Pro is definitely a US product, and this means that tax options are pretty much par for the course in that country. You can set-up multiple tax rates and delivery regions to cope with various state taxes in the US, but the customer must choose which rate they think is applicable at the checkout. This aside (perhaps an Anglicised version could be forthcoming if there is enough demand!) the price to feature ratio is excellent and for the SOHO user ecBuilder Pro would be good choice.

PCPlus Verdict

ECBUILDER PRO V5

✓ FOR

→ Wizard based approach, extra content pages and price

✗ AGAINST

→ US slant and tax handling

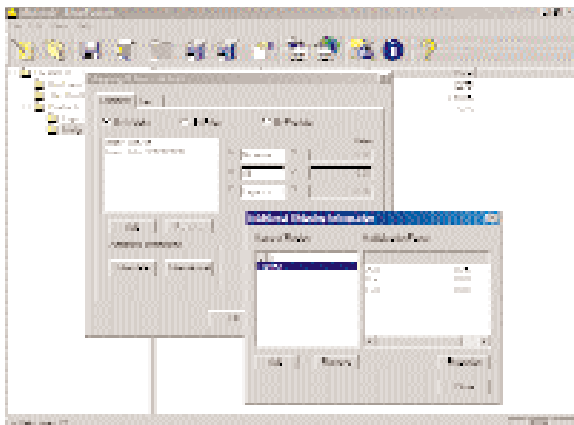
Specifications6

Quality9

Performance8

Value for money9

OVERALL7



ShopFactory Pro V4

PRICE £234 **EX VAT** £199 **SUPPLIER** 3D3
DISTRIBUTOR Softwair **PHONE** 07092 025 314
ONLINE www.shopfactory.co.uk

Plenty of tailoring options and simple design, ShopFactory is best of both worlds

Coming from nowhere, ShopFactory has certainly grown into a major contender over the years. Although Actinic Catalog and ecBuilder Pro are good examples of their breed, ShopFactory has the edge when it comes to developing more than one shop. You can either buy ShopFactory Pro and create as

Requirements

Pentium PC or higher with 16MB RAM, 20MB free hard drive space, Win95/98/2000 NT 4.0 or higher

Tested on

Intel Pentium II 350MHz with 128MB RAM running Win98

many shops as you like for your own use, or ShopFactory Developer, and design as many shops as you like for others.

Again, you get the tree-like display of departments and products, so you can click to edit or copy details directly, or use the drop-down menu for overall shop setting and other defaults. Forms and dialogs ask for the information required, ShopFactory placing items on the finished

← **ShopFactory's shipping and delivery options can be as simple or as sophisticated as you like.**

Web page according to the template you selected at design time. The result is plain HTML and can sit on just about any Web server you like.

Products have the usual options such as colour or size, and also special cases such as add-on battery pack or stainless steel finish with price additions or subtractions associated with each option. Like Actinic, the weight-based shipping calculations are excellent, and you can also create your own 'CSV' file or use one supplied by your carrier for total flexibility.

For online processing of credit cards, ShopFactory comes with links to more than 20 real-time online processing banks, and just about any bank can be accommodated by editing the templates concerned. Orders arrive via e-mail with a free SSL service and PGP encryption built-in. No order processing software is included but links to the major accounting packages are under development.

Tax, again, is handled by regional and international locations, so UK VAT can be catered for by creating the rates applicable inside and outside the EU. If the customer elects to pay no tax, then the software insist they input a tax registration number for your reference. Pro rata VAT on delivery is also on the cards, as 3D3 are keen on exploiting the UK market.

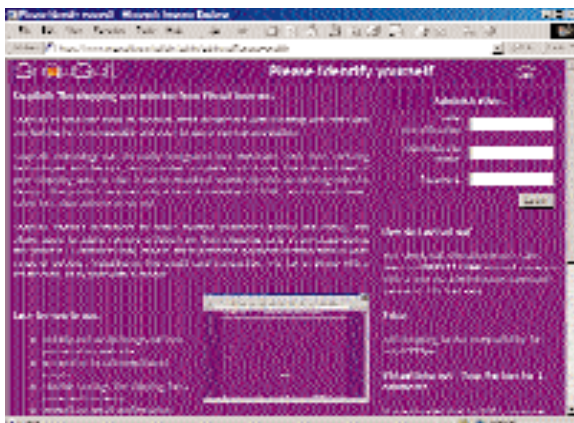
With more than 30 themes to pick from, complete control over background colours, textures, button sets, the language used and font attributes as well – straight out of the box ShopFactory is simple to use. Once you start delving into the underlying templates, however, you can achieve just about anything, which means power users and developers won't be disappointed. One for everybody then at an excellent price.

PCPlus Verdict

SHOPFACTORY PRO V4

✓ FOR	✗ AGAINST
→ Excellent flexibility, delivery and tax handling at a good price	→ No order processing

Specifications	7
Quality	9
Performance	8
Value for money	8
OVERALL	8



VI SnapSell

PRICE £199 per year **EX VAT** £169 per year
SUPPLIER Virtual Internet **PHONE** 0800 117744
ONLINE www.snapsell.com

If you have a Web site and just want to add e-commerce, this is an interesting alternative

If you are already up and running with a fully functioning marketing Web site that looks good and you only have a few items to sell, perhaps all you need is to add a few 'buy now' buttons to your existing pages.

If so, SnapSell is aimed directly at you. The software is actually a set of shopping basket scripts that reside on the server

Requirements

PC or Mac with Win95/98/NT/MacOS version 4.0 or higher Web browser software

Tested on

Intel Pentium II 350MHz with 128MB RAM running Win98

back at Virtual Internet, so when you drop pieces of code into your Web page all you are doing is calling these to implement your shopping basket, checkout and so on. You obviously have to add parameters to the code snippets to tell the VI server which product you are talking about – but that's the extent of the programming.

In order to tell SnapSell about your company and products, so it can display this information on the order form and checkout page, you need to access the main SnapSell server. Here you can enter shipping zones,

company information, your bank details and terms and conditions. You can also choose background colours and images for the shopping basket pages and buttons, to tie in the SnapSell site with your own.

Shipping consists of six zones, each with a shipping price which applies for the entire order going to this zone. Although you can override this with a delivery cost per item, or a formula which reduces the carriage charge by a percentage based on the quantity of products.

You don't have to tell the VI database much about your products, all it needs to create the checkout and order form is an item number, a product description and a price. In use, you would add as much information about the item you were selling as you liked on your marketing site

– SnapSell just needs to know the basics for adding-up and completing the order.

Payment gateways consist of a link via VI's SSL layer through to the DataCash online payment authorisation, but you can authorise the payment yourself by fax, post or phone. You get an e-mail order notification when something is sold, and then you go online and use the order tracking database to access your order.

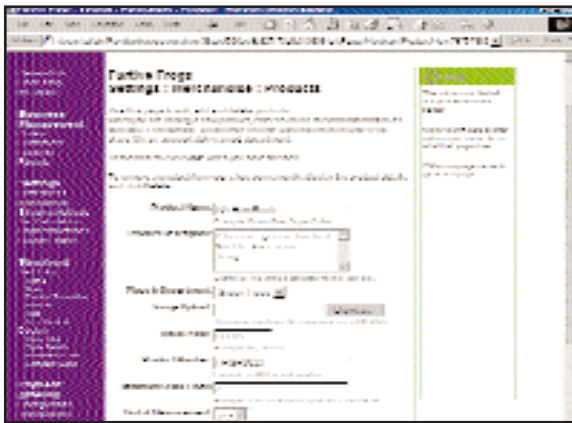
You have to know the layout of your existing pages in order to drop the pieces of code where you want them, and you will obviously have to make sure both your marketing site and the SnapSell product database are in synchronisation at all times. The cost also seems a bit high for such a basic service, especially as some hosts provide shopping basket scripts for free with e-commerce Web space.

PCPlus Verdict

VI SNAPSELL

✓ FOR	✗ AGAINST
→ Simple drop in shopping basket script calls	→ Seems an expensive service for the features offered

Specifications	5
Quality	7
Performance	7
Value for money	5
OVERALL	6



Shopbuilder

PRICE From £25 per month **EX VAT** From £21 per month
SUPPLIER NTL **PHONE** 0845 650 0107 **ONLINE** www.ntl.com

Major player in Internet services launches DIY online shop builder

Pundits tell us that one day all software will be delivered via the Internet on a 'use as you need but don't pay to own' basis – otherwise known as ASP. That may be so, but online shop provision is already here and Shopbuilder is a typical example of the genre.

Once online and logged on to the software, you get control panel access to

Requirements
 Win95/98/NT/MacOS
 with version 4.0 or
 higher Web browser
 software
Tested on
 Intel Pentium II 350MHz
 with 128MB RAM
 running Win98

back office admin functions like built-in order tracking, along with the overall shop settings and product entry details. Shopbuilder is simple to use; you choose from the control panel on the left, and the main display asks the questions required in typical catalogue building fashion.

Along with the product catalogue you also get to build a home page, a news page, promotional pages and unlimited style-text pages. This means your NTL Shopbuilder can be used for marketing and e-commerce, saving the job of integrating two sites.

Stock can be uploaded from a plain text file or entered manually with the ability to classify products into departments with the usual weight, size and colour options.

Tax and shipping are average for this type of software. You get a number of user defined tax classes for individual VAT rates, along with a table of tax areas. In theory you could use this combination to manually cater for most situations, but the customer will be left to choose which tax location and band at checkout time.

Again Shopbuilder shipping features simply consist of a basic table of user definable shipping methods for the customer to choose from at checkout time, each with a price and whether they are taxable or not.

Shopbuilder doesn't store credit card

details or forward them to the merchant, so in order to take credit card payments you will need to sign-up for the NTL Payment Gateway (even if you have an offline merchant account). NTL suggests you accept cards by phone or apply cheque with order type delivery methods to overcome this, but this isn't ideal. When it comes to design and layout there aren't many themes to choose from either, but you can change colours for page backgrounds, links, tables, fonts and so on.

NTL Shopbuilder is a bit disappointing. The software is simple to use, the order tracking is good, and the reports available are useful – but e-commerce features are basic compared to the off-line catalogue builders featured here. Add to this the extra cost of the payment gateway, and it also starts to look expensive.

PCPlus Verdict

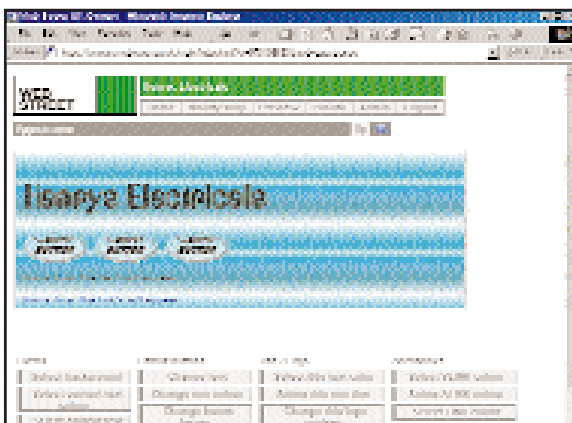
SHOPBUILDER

✓ FOR
 → Easy to use with order tracking and useful reports

✗ AGAINST
 → Limited features and payment gateway extra cost

Specifications6
Quality7
Performance7
Value for money6

OVERALL6



Web Street

PRICE Up to 20 product lines free with banner (£20 without)
EX VAT Up to 20 product lines free with banner (£17 without)
SUPPLIER Web Street **PHONE** 0870 729 5666
ONLINE www.webstreet.co.uk

Low cost introduction to online shop building from independent innovator

Looking at many of the major players in the online shop builder stakes, you can definitely get a feeling of déjà vu. The likes of Virgin, NTL, Pipex and co have all launched their online shop provision services on the back of existing platforms – e-commerce

Requirements
 Win95/98/NT/MacOS
 with version 4.0 or
 higher Web browser
 software
Tested on
 Intel Pentium II 350MHz
 with 128MB RAM
 running Win98

systems from people like InterShop, IBM and Intel for instance.

Web Street is an independent company who were in right at the start of all this, complete with its own software, all written in-house. As such it can do deals like up to 20 products free – which is a bonus.

The basic design concept is similar to others of this genre; look and feel are fairly basic, with a menu driven interface offering hints and tips on each page as you go. There are no pre-designed themes to choose from, but the appearance can be altered by choosing different screen layouts, button styles, fonts and background colours. You can also decide how you would like the text to wrap around the image for each department and product.

A nice touch is the ability to add as many other content pages as you like, including a homepage with basic company details, plus a contacts page and multiple customer response forms.

Tax details have been upgraded in this version of Web Street, and you can now create multiple destinations and apply individual tax rates to each. Delivery calculations have also been updated, with the software offering a four stage process of postage category, destination, method and actual postage rate. So you can have category 'a' item, going to the

USA via Air at £15 – very comprehensive for on-line shop building software.

Orders from customers are managed online, and you can be notified by e-mail when an order arrives, or if a visitor to the site fills in a response form or asks for a catalogue. Credit card payments can be processed manually using your own merchant account, or via online providers like NetBanx, WorldPay and DataCash.

Web Street is typical of the genre when it comes to design options, but well above par concerning tax and shipping calculations. You still won't find quite the feature-rich flexibility of offline catalogue builders here, nor the themes-based design capabilities. Web Street, however, is a viable alternative to products like NTL Shopbuilder, and you get your site submitted to over 1,000 search engines.

PCPlus Verdict

WEB STREET

✓ FOR
 → Value for money, plenty of shipping options

✗ AGAINST
 → Order processing basic and no design themes

Specifications7
Quality7
Performance7
Value for money8

OVERALL7

134 Understanding how your PC gets going can help you fix problems

135 Four quick Excel tips that will save you time and effort

136 How to get your pictures looking as good as possible

142 It is possible to restore DOS in Windows Me. We show you how

PCPlus HELPDESK

→ We solve your PC problems

Windows Millennium is in the shops and appearing on new PCs. Want to know how to get the reboot-to-DOS option back? Of course you do, and it's in this month's **HelpDesk**. Also in this issue, news of an image compression format so good that JPEG as we know it is officially obsolete. There's plenty of help with MS Office, for example a drop-down printer selection box for Word 2000, tips for Excel, and a brief but helpful tutorial on Access. Plus, learn how to fix a broken Recycle Bin, save and restore your MBR, deal with perverted shortcut links and have windows open exactly where you want them.

Keep the questions rolling in, but please note that I can only answer the ones chosen for publication.



Ian Sharpe/HelpDesk Editor
ian.sharpe@futurenet.co.uk

Write in!

E-mail your questions to:
ian.sharpe@futurenet.co.uk

Or write to: **HelpDesk, PC Plus**
30 Monmouth Street
Bath BA1 2BW

Or fax: 01225 732295

Look out for these icons for useful extra information



Visit our forums at www.pcplus.co.uk and swap tips with other PC Plus readers



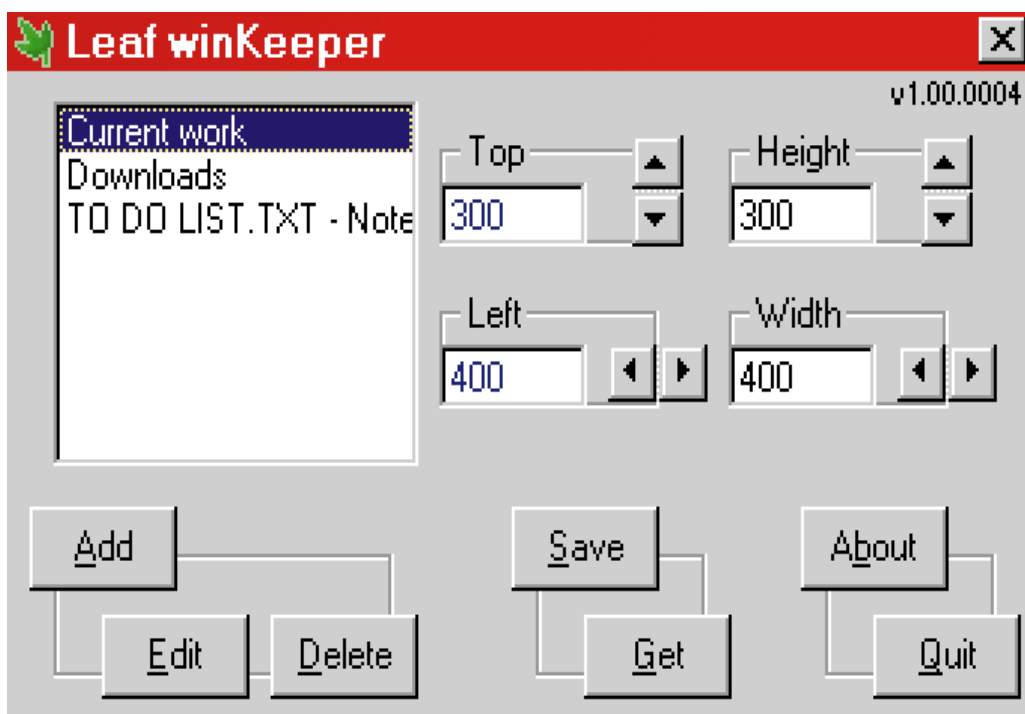
See our **SuperDiscs** for useful software and extra tutorial files



When you see this, visit the Web site for more information, advice or support

Help us help you!

We get thousands of e-mails a month so do please send your mails to the right department. If you are having CD problems e-mail pcplussupport@futurenet.co.uk.



↑ Control freaks can put every window in its place with this free utility from ArcaneWood.

WINDOWS

Saving window positions

Q I want to organise my desktop better so I made a new folder called 'Current work' containing shortcuts to folders and files which I am currently working on. I placed the icon at the bottom right of the screen.

When I double-click this I want the Explorer window to always open with the same size and position, filling the bottom right-hand sixth of the screen, over the icon itself. It always opens on the upper left. I know you're going to say "Run TweakUI and tick the option to save Explorer settings". Been there, done that, and still it doesn't work.

Ideally, if I can get Windows 98 to remember where to open windows, I can run several

shortcuts from the Startup folder and have my desktop divided into panes on boot-up.

Mary Shah

A What should happen, if you have the right settings under View / Folder Options, is this: pressing 'Like Current Folder' sets the default Explorer style to be the same as the current instance of Windows Explorer. That means window size and location too.

Ticking 'Remember each folder's view settings' in the list underneath should enable you to open new Explorer windows, move, resize and close them, and for the window to reopen with its customised size and location next time.

If you've done all that, there's obviously something broken and I don't know what that would be. If you don't want to contemplate reinstallation of Windows

(installing Windows over the top of itself doesn't lose your settings, applications or data, though some problems won't be cured by it) a solution may be to use a program which controls start-up size and location. These utilities appear to work by constantly watching for particular windows to open, then manipulating them in much the same way as you would move and resize them manually.

I'm not sure I like this kind of thing because it puts an additional burden on your memory and CPU, albeit a small one. If you want to try one of these programs, have a look at a freebie called Leaf winKeeper from ArcaneWood (www.geocities.com/arcanewood/). This seems to work well. You build a list of window titles for it to look for, along with their sizes and positions. A moment after a listed window opens, it is moved and resized.

WINDOWS

Preserve your MBR

Q I run Win98, Win2K and Mandrake Linux 7.1 on my system but ran into problems with Linux after making it write to the MBR. Afterwards I could not boot into any O/S. I once read about backing up the MBR before installing other operating systems.

It might have been in your magazine, but I have not able to locate it. It would be greatly appreciated if you could run a short explanation of backing up the MBR and restoring it. Better

still, tell us of the various programs that can automatically do this.

Root

A It isn't a bad idea to keep a copy of your Master Boot Record safe on a bootable floppy – it might dig you out of a deep hole sometime. The MBR is stored right at the start of the hard disk and contains the partition table and program code to begin loading the operating system.

Boot managers, newly installed operating systems and viruses are all liable to change the contents of MBR for their own purposes.

Sometimes the MBR can become corrupt, making it impossible to start the computer and your partitions vanish. They're still there, just gone ex-directory.

On a Windows or MS-DOS PC, the quick fix is to boot from a system floppy and type:

```
FDISK /MBR
```

Fdisk will install a standard MBR and if that was the only problem you will now be able to boot from the hard disk. If you had a boot manager installed in the MBR, that will have been lost and needs reinstating. How you do this depends on the manager and it's

probably easier to restore a copy of the MBR made when everything was working properly.

Back in issue 168 I mentioned a program called MBRwork from www.terabyteunlimited.com/FREESTUFF.HTM. MBRwork is able to reconstruct a wiped-out partition table which alone is enough to make it valuable. What I didn't say is that MBRwork can save and restore the MBR. The menu options referring to the first track are the ones you want.

MBRwork and the MBR image should be put on a bootable floppy disk so you can get at them in the event of hard disk failure. As an experiment I saved the first track with MBRwork and then ran FDISK /MBR. This killed my boot manager. Running MBRwork again, I restored the first track and rebooted. The boot manager was back and everything worked as before. There are other ways I could have restored my boot manager, but this was the easiest.

Some computers lock the MBR to prevent it being overwritten accidentally or maliciously – check your BIOS set-up screens if you have trouble.

On the subject of disappearing boot managers, I use BootMagic. Every time I install Windows into a partition, the set-up program rewrites the MBR. With Windows 98, you can avoid the chore of reinstating the boot manager by running Setup.exe with a command line switch that tells it not to replace the master boot record:

```
SETUP /IA
```

This is one of many switches that modify the behaviour of Setup.exe. The full list is too long to print, but it's easy to get at – just run SETUP /? from a DOS prompt or check the Windows Resource Kit. Here's an example:

```
SETUP /IE /IQ /IR /IS /NR /IV /IW
```

/IE Skip startup disk creation
/IQ Do not check for cross-linked files
/IS Do not run ScanDisk
/NR Skip registry check
/IV Do not display billboards
/IW Do not display license agreement

This is just a sub-set of the switches available in Windows 98. They vary between versions of Windows. Unfortunately, Millennium has cut back drastically and /IA is not valid.

DELVING DEEPER

How a PC boots up

Understanding how a PC gets itself going can help you fix problems and set up multi-boot systems

Ranish Partition Manager Version 2.38 Beta 1.91 March 03, 2000

Hard Disk 1 8,207 Mbytes [1,046 cylinders x 255 heads x 63 sectors]
Using LBA

#	Type	Row	File System Type	Starting sector	Number of sectors	Ending sector	Partition Size [KB]
0	MBR		Master Boot Record	0	1	0	0
1	Pr1		Unused	1	62	62	31
2	>Pr1	1	windows FAT-32	63	8,996,337	8,996,399	4,498,168
3	Pr1	2	Hidden FAT-32	8,996,400	2,859,570	11,855,969	1,429,785
4	Pr1	3	Hidden FAT-32	11,855,970	2,714,985	14,570,954	1,357,492
5	Pr1		Unused	14,570,955	2,238,705	16,809,659	1,119,352
6			Unused	0	0	0	0
7			Unused	0	0	0	0

ENTER - Edit options S - Save MBR to file L - Load MBR from file

— MBR —

#	Partition	Size	MBR Executable code:	Unknown IPL	Use Space to cycle through the values
1	FAT-32	4,392	Boot interface type:	Compact	
2	Hid FAT-32	1,396	Check for viruses:	Yes	
3	Hid FAT-32	1,325	Boot prompt timeout:	6	Press Enter when done
4	Unused	0	Default boot choice:	Not set	Press F10 to simulate

F1 Help F2 Save F3 Undo F4 Mode F5 Disk ESC Quit

↑Ranish Partition Manager (www.ranish.com) is another program able to save and load the MBR. It isn't for beginners, though.

When you push the PC's power button, a lot has to happen before you arrive at working operating system.

Initially the processor begins executing a program inside the BIOS. This performs the power-on self test (POST). Once the hardware configuration has been itemised and found to be in working order, the BIOS kickstarts the operating system.

Since there are many operating systems for the PC and the BIOS can't know what you've installed or on which disk or partition, it has to hand control over to another program which can continue the boot process.

The location of this program is always the same: the start of the first hard disk, floppy disk or other bootable device. In the old days a disk in the floppy drive was always given preference over the hard disk, but now it is normally possible to set the order in the BIOS set-up screen.

On a hard disk, this second-stage program lives in the Master Boot Record (MBR) along with a table which lists the partitions, their start and end positions, their types and which one is active. The MBR is always in the very first block of information on the disk – track zero, sector zero – which is how the BIOS knows where to find it, no matter what the geometry of the disk.

Once the BIOS has loaded the MBR into memory, it transfers control to the program there. Normally, this does nothing more than find the active partition and load the program it finds at the start of it – in the partition's first sector, known as its boot sector. This third-stage program is specific to the operating system in that partition and knows the specific details of how to load it.

Some viruses plant themselves in the MBR so that they are started instead of the normal program. Once installed in

memory, the virus may continue the rest of the boot-up, to make things look normal and enable it to do its work while you are using your computer.

Disk overlay programs such as OnTrack Disk Manager live in the MBR, too, as can boot managers. These present you with a list of available operating systems, activates the partition of the one you choose, and loads and runs its boot sector code.

This is why overwriting the MBR with a pristine new version can wipe out your boot manager or the program which enables your older BIOS to talk to a bigger disk than it was designed for.

A new MBR won't affect the NT boot loader in a system that dual boots with Windows9x, say, because that lives in the boot sector of the Win9x partition. This gets executed as the 'stage three' program – when the MBR code hands over to the boot sector code.

WORD

PC Plus
SUPER DISC | prog\files\helpdesk\

Quick printer selection

Q I have been trying to find a way to have two printer set-ups in Word, with two toolbar buttons so that I can simply direct documents to be printed on either upper tray paper (for example, for best) or lower tray paper (for example, for draft). By bringing up the Print menu and changing the set-up it's easy but time-consuming. Is there an easier way to do what I want? Or if not, is it available in any other WP software. I think it would make me change.
Mark Brown

A There's no need to defect. Use this tip from reader Andy Duncan, printed in issue 162 of **PC Plus**, to make separate entries in the list of installed printers for the one printer, but with different options selected:

"If you find yourself regularly opening a printer's Properties dialog to change some of the options, here's a shortcut. Open the Printers folder, double-click 'Add printer' and go through the procedure to add a second entry for the same printer. Open its Properties dialog and make your custom settings. Change the properties for the original entry to the other settings. You can now choose the appropriate printer entry in Print dialog boxes."

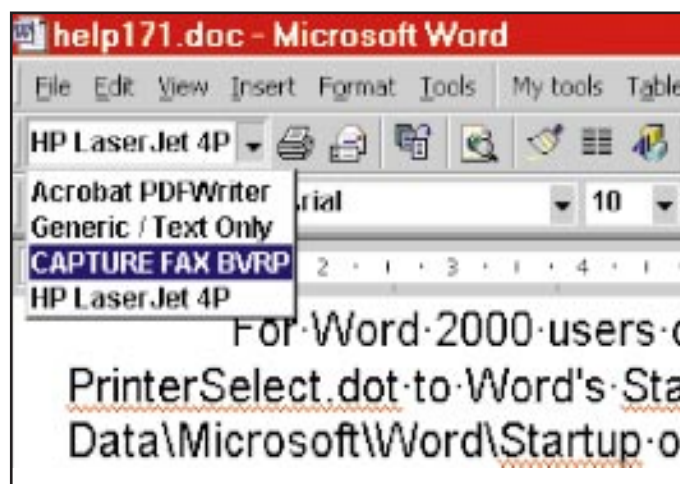
Remember that you can rename printers from the Printers folder in the same way that files are renamed. To produce the buttons you need a macro for each printer. Repeat this procedure for each one:

- Go to Tools / Macro / Record New Macro.
- Name the macro appropriately, but without spaces, for example SelectLaserDraft
- Click the Toolbars button and drag the macro out of the list on to a toolbar.
- Right-click the newly made button and edit the text to suit. Press [Return] and then click Close in the main dialog.
- Go to File / Print. Select the printer. Click Close.
- Halt the recording by pressing the button showing a blue square.

This next bit isn't essential unless a macro doesn't work, but if you're feeling confident press [Alt][F11] to bring up the VBA editor. Locate your macros by double-clicking New Macros under the Modules branch of the tree leading from the Normal template. Check that the body of each one (the bit between the Sub and End Sub lines) contains just an ActivePrinter statement followed by the printer name in quotes.

For Word 2000 users only, there's a nicer option on the **SuperDisc**. Copy PrinterSelect.dot to Word's Startup folder. This may be in C:\Windows\Application Data\Microsoft\Word\Startup or \Program Files\Microsoft Office\Office\Startup. Word will auto-run the program code in the template on start-up, putting a drop-down list of printers on the Standard toolbar.

Just pick the printer you want. If you change the active printer from the Print dialog, or add/remove printers from the Printers folder while Word is running, the list will reflect the change but may take a little while to catch up. If you want to remove the feature, close Word and delete the template. Back in Word, hold down [Alt] while dragging the control out of the toolbar area. Drop it, and it'll vanish.



↑ This drop-down selector for Word 2000 displays the active printer and saves going through the Print dialog to change it.

EXCEL TIPS

Four choice cuts

These quick tips for Excel users are sure to save you time and effort

	C	D	E	F
	Quantity	Price ea.		
	35	£4.99		
	2	£19.99		
	15	£8.99		
	25	£7.99		
	10	£9.99		
	Total			=SUMPRODUCT(array1,array2,array3,...)

↑ Can't remember the parameters for a dusty old formula? There's an easy way to find out.

CUT THE COPYING

Need to perform exactly the same action on several sheets within a workbook? Hold down the [Ctrl] key and click on the sheet tabs. This selects multiple sheets and Excel adds the word 'Group' to the window title. Whatever you now do on the visible sheet – including typing and formatting – will happen on the other sheets too. You can select a sequence of sheets by clicking on the first tab and [Shift]-clicking on the last. Un-group the sheets when you've finished by clicking one of the tabs.

CUT THE BUTTONS

Excel 2000 users annoyed by multiple taskbar buttons when several sheets are open can revert to the traditional one-button style from Tools / Options / View. Uncheck 'Windows in Taskbar'.

CUT THE CONFUSION

If you tend to have print-outs lying around, it's handy to have the full path to the workbook printed in the header or footer. You can have the filename printed easily enough: got to File / Page Setup and click Custom Header or Custom Footer. The filename field is now added by clicking the button with an Excel icon. But for the full path, you have to resort to a bit of VBA. Bring up the VBA editor with [Alt][F11]. Double-click on ThisWorkbook and type this:

```
Private Sub Workbook_BeforePrint(Cancel As Boolean)
Dim s As Object
For Each s In ThisWorkbook.Sheets
s.PageSetup.LeftFooter = ThisWorkbook.FullName
Next
End Sub
```

Better still, copy the code from the file XLvba.txt file in the HelpDesk folder on the **SuperDisc**. It has been tested on Excel 97 and 2000. Close the editor and look for the path at the bottom left of the page in the print preview.

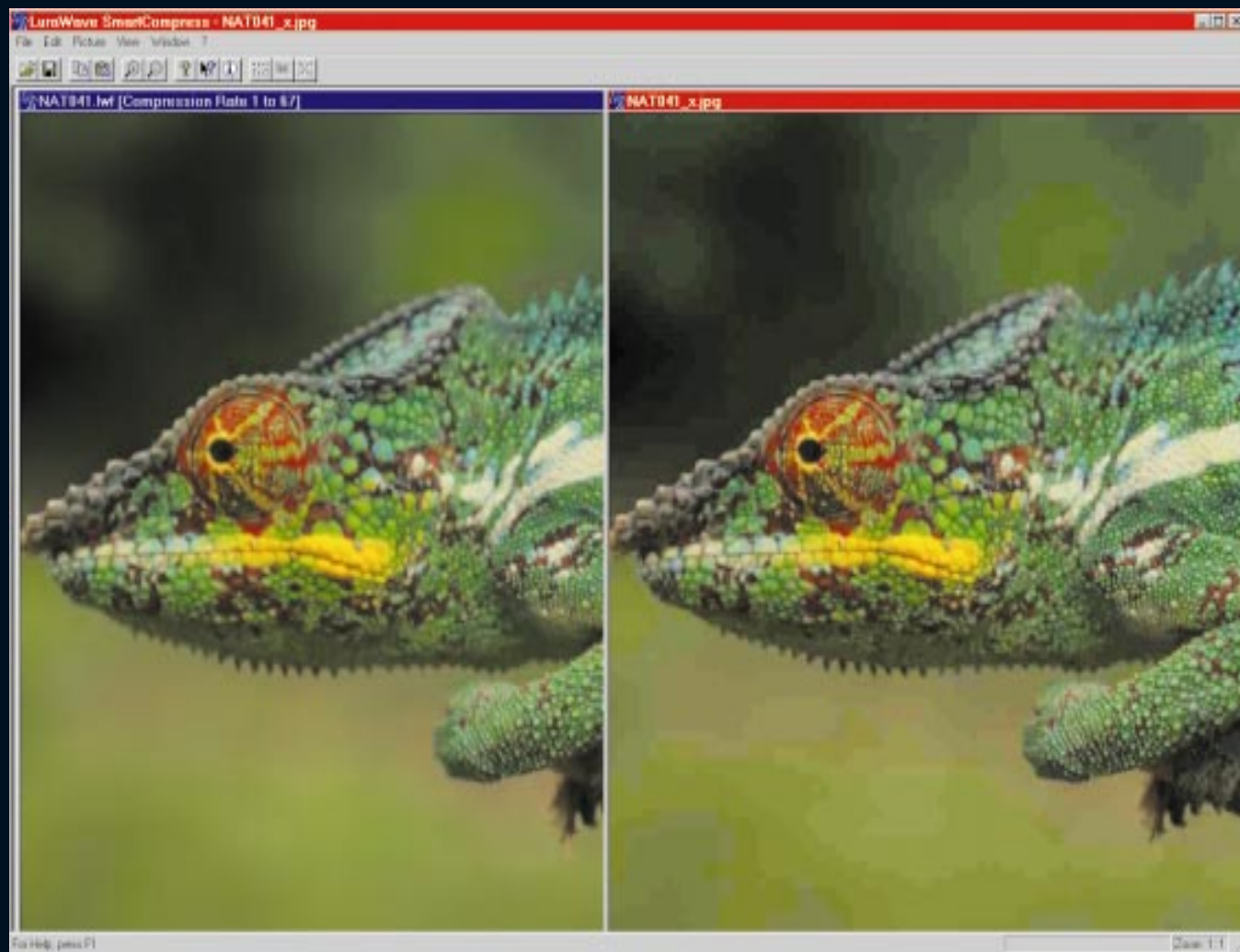
CUT THE HELP FILE

Okay, so you can remember the name of the formula you're about to enter but you're a bit hazy on the parameters required. Avoid a detour into the help file by typing the formula's name as usual, then press [Ctrl][Shift][A]. Excel will present a template for the parameters.

GRAPHICS

Better than JPEG?

How to get the best out of your pictures



↑ This picture began as a 300K JPEG already 66 per cent compressed from around 900K. I squashed it down to just 39K in both wavelet (left) and JPEG formats. The JPEG is unusable because out-of-focus background detail has crystallised into colour bands. The wavelet version is hard to distinguish from the original. Not all pictures show such a strongly favourable comparison but wavelets usually give better looking results at extreme compression ratios.

If you do much with bitmap graphics you'll probably know all about the trade-off between compression ratio and image quality with JPEG (.jpg) files. JPEG is a lossy compression format – information is discarded so that image data becomes less complex and therefore more compressible.

The more you throw away, the more the picture squashes down but the worse it looks. A heavily compressed JPEG is ugly, with artefacts such as a halo effects and loss of colour variation.

If you're willing to sacrifice quality, there are ways to do it that don't look as bad as JPEG at high compression ratios.

Among the other lossy formats are ones based on wavelet technology. For a given file size, a wavelet-compressed image tends to look better than a JPEG version.

Wavelet compression hasn't hit the big time yet. I doubt you'd be surprised if I told you the JPEG people were doing their

best to run it down, but that's far from the case. The latest version of the JPEG format, JPEG2000, moves over to wavelet technology. See www.jpeg.org for the full story.

Whether JPEG 2000 will become a widely supported standard remains to be seen. Part of the agenda for mentioning wavelet image compression here is to give it some publicity. But this is HelpDesk, and to earn a place in these pages it has to be a practical proposition. That means cheap or free tools for compressing images and easy ways to view them.

When I discovered wavelet compression last year, tools were thin on the ground. The situation is improving and you could try Elecard Wavelet Image Compressor from www.elecard.com/products/wavelet.shtml. It's worth a look if you want a quick sampler.

The comparison between JPEG and wavelet compression you see on that

page is representative of what will happen to your own images. Elecard is shareware and works well enough, but its proprietary file format isn't supported by any other product I know of. This cripples its usability.

The prospects are better with LuraTech's LuraWave products, which are available at www.luratech.com. As well as a freeware compression program, you can get a plug-ins for PhotoShop, Paint Shop Pro, Web browsers and others.

LuraTech has also produced a plug-in for the freeware file viewer, IrfanView (www.irfanview.com). This program is winning a lot of friends and the addition of lwf to its repertoire is a real bonus. Look for the plug-in under 'What's new?' at the IrfanView site. At the time of writing this didn't actually work. Hopefully it will have been sorted out by the time you get there.

Wavelet compression can be used for

both lossless and lossy compression, and LuraTech's lwf files support both. When saving a file you can choose a quality rating, the compression ratio or the target file size. Considering the price of the tools, they must be worth a trial if you want smaller image files.

If you're now wondering what on earth a wavelet is, I must confess that I haven't fully wrapped my head around that one! True understanding requires university-level maths beyond me.

Type 'wavelet' into any Web search engine and you will get dozens of hits with many people offering their own explanations.

Try a few for yourself if you're keen. <http://ise.stanford.edu/class/psych221/00/shuoyen/> is one of the better ones I've seen for the non-mathematician and gives a fair idea of what's going on. The animated Java demonstration I downloaded from www.jpeg.org is a good companion to it.



↑ The underscore in this message probably represents a character the file system doesn't allow. Normally it's easy to fix, but it's a bit trickier when the file is inside the Recycle Bin.

WINDOWS

My bin won't empty!

Q Having started to run out of disk space on my PC I decided to do some housekeeping. The problem is that when starting with an apparently empty Recycle Bin in Win95, if I delete a number of files then empty the recycle bin from the desktop icon without actually opening it, the confirmation message appears with an ever increasing number of files irrespective of the number I actually delete. By accepting to empty the recycle bin I then get the error message "Cannot delete (_RCAD E: Cannot find the specified file."

The free disk space does not seem to go up by very much once I clear the bin. What have I done?

Ramsay Marr

A This is probably a variant of the well-known problem of illegal characters appearing in filenames. Although you can produce these files deliberately, usually they arise from a rogue program – either it's badly written, or it crashes and tips some junk into the disk directory. The junk contains characters not allowed in filenames, and the operating system refuses to touch them.

If Windows encounters such a name during a multi-file operation, it just quits at that point, leaving subsequent files unprocessed. When you empty your Recycle Bin, most of the files aren't actually being removed.

The standard fix is to run ScanDisk, which should cure invalid filenames. If that doesn't work, and it may not do because the Recycle Bin folder has its hidden and system attributes turned on, proceed as follows. Reboot the machine to an MS-DOS prompt. Type the following:

```
DELTREE C:\RECYCLED
```

Answer the prompt by pressing the [Y] key. Repeat for any other hard drives available on your system using the appropriate drive letter and a colon in place of 'C:'. This should delete the Recycle Bin folders which Windows will then re-create when you restart the computer.

HP OFFICEJET

Dtrole error

Q I have become one of the millions who now rely on the PC to earn their crust! I am using Win98 and Office 97. While in Excel an error message often appears(daily) saying DTOLE has caused an error with KERNEL32.DLL along with a whole load of info meaning nothing to me. Any advice you can offer would be greatly appreciated.

Robert Silvera

A Dtrole.exe is a program associated with Hewlett Packard Officejets. You need an updated driver from HP. Go to www.hp.com and type 'dtrole' into the search engine. A list of relevant support documents will be returned, which should help you resolve the problem.

WINDOWS

Copying with ScriptIt

Q I followed your instructions in issue 167 to obtain a copy of ScriptIt.exe from the Microsoft Web site. I have studied the manual but I am unable to copy a file from one folder to another without opening the file and saving it. I would appreciate any suggestions you may have.

Donald Campbell

A For the benefit of new readers, I'll explain that ScriptIt is a utility distributed by Microsoft which enables you to automate tasks in

Windows by means of simulated keystrokes. You write a script of keypresses and ScriptIt plays them back whenever you like. It's a great time saver and one of many such programs, some of which have featured in **HelpDesk** before. ScriptIt is available from www.microsoft.com/NTServer/nts/deployment/custguide/scriptit3.asp. Download the documentation file – the

ScriptIt program is included with it. Although ScriptIt is mainly about manipulating windows, there are a couple of things you can do to extend its capabilities. The first is to use MS-DOS batch file commands. The syntax is as follows:

```
run=copy "c:\autoexec.bat"
"c:\my documents\flibby
flobby floo.bat"
```

It's all one line. You feed DOS commands to the 'run' keyword. To enable ScriptIt to identify the command as an internal one, you must prefix it with a left-slanting single-quote obtained by pressing the key below [Esc] on most keyboards – the one with three cryptic-looking characters on it. ScriptIt won't accept a vertical quotation mark for this.

The other avenue is to use ScriptIt to build and execute scripts written in languages supported by the Windows Scripting Host. See the MkFile command in the documentation.

DELVING DEEPER

How the Recycle Bin works

There's more to the circular file than meets the eye. Learning more about it will help you fix a breakdown

Windows Explorer displays a number of folders that aren't straightforward disk folders like the rest. The Recycle Bin is one of them.

When you delete a file in Explorer, it is copied to a folder called \Recycled, ready to be restored if you so desire. In reality, the Recycle Bin shows the contents of more than one Recycled folder. Each partition has its own, but Explorer running in Recycle Bin mode conglomerates them into a single virtual folder.

Get into a Recycle Bin folder with MS-DOS – open an MS-DOS window and type:

```
C:
CD \RECYCLED
DIR
```

Even if you aren't familiar with DOS, it'll be obvious that the filenames you see listed don't bear any relation to the names of files you have deleted. When a file is moved here, it is renamed with this convention:

```
D<original drive letter of
file><#>.<original
extension>
```

The <#> represents an index number. So FRED.DOC from drive E: will become something like DE77DOC.

The real name and original path are added to a hidden index file called

INFO or INFO2 or some such. Find out exactly what it's called by typing:

```
DIR /A:H INFO*
```

If you want to take a peek inside, type:

```
EDIT /75 INFO2
```

Substitute whatever name was shown by DIR if it isn't INFO2. It's mostly unintelligible to the human eye, but you will be able to pick out the original filenames.

If the Recycle Bin is misbehaving, you can delete the whole thing as described in the answer to Ramsay Marr's question. If you need to, you can copy files out first using MS-DOS's COPY command like so:

```
COPY filename
C:\WINDOWS\DESKTOP
```

That's all on one line and will copy 'filename' to the desktop.

Note that while the above applies to Windows NT, the situation is slightly more complicated by the fact that each user gets a personal recycle bin – see Knowledge Base article Q171694. And if you hit a problem that requires you to dig deeper into the workings of the Recycle Bin, try article Q136517.

→ A report gives each person an itemised sub-bill. Once defined, you can re-run the report on future bills.

NT/2000 TIP

User name under My Computer

Here's an old favourite NT 4 tip updated for Windows 2000



↑ 'My Computer' in Windows 2000 now showing the computer name and logged-in user. Ah, that's better.

I always found it handy to have the My Computer icon in NT4 show the logged-in user name instead of 'My Computer'. You can walk up to a switched on but deserted computer and know who's using it. It's also a reminder that you've left yourself logged in as the administrator when you're about to hand over to someone else.

I could never get the required registry hack to work on Windows 2000, but have now discovered how it's done. Run Regedit32 (not Regedit) and drill down to HKEY_CLASSES_ROOT\CLSID\{20D04FE0-3AEA-1069-A2D8-08002B30309D}.

Double-click the LocalizedString value and copy its value to the clipboard. Delete LocalizedString. Go to Edit / Add Value. Name the value LocalizedString again, but this time make its type REG_EXPAND_SZ. Click OK and paste the copied value into the next dialog. The end of the string will contain the text 'My Computer' (no quotes). Replace it with:

```
[ %computername% ]
%username%
```

or some other phrase involving the two environment variables, and taking care to leave everything beforehand untouched.

Click OK, close Registry Editor and press [F5] to refresh your desktop.

Microsoft Access - [WhoSpentWhat]

File Edit View Tools Window Help

100%

WhoSpentWhat

Name	Date	TelNum	Cost
Jim	01/01/2001	45678	£10.00
	08/02/2001	45678	£11.00
Summary for 'Name' = WhoSpentWhat (2 detail records)			
Sum			£21.00
Joe	10/02/2000	03456	£2.00
	05/01/2001	01234	£9.00
Summary for 'Name' = WhoSpentWhat (2 detail records)			
Sum			£11.00
Julie	06/02/2001	99999	£8.00
	07/02/2001	99999	£5.00
	09/02/2001	88888	£33.00
Summary for 'Name' = WhoSpentWhat (3 detail records)			
Sum			£46.00
Grand Total			£78.00

Page: 1 of 1

Ready

ACCESS

Phone bill management

Q I share a house with several people and have to sort out their contributions to the phone bill. As an experiment I am scanning the itemised bill and using TextBridge to convert it to text. The bill is then imported into Access 2000. I have a list showing which numbers each person commonly calls. How do I set up Access to match the bill with this list and show how much each person owes? This won't account for all the calls made, but we

divide up the remainder evenly among us.
Ollie

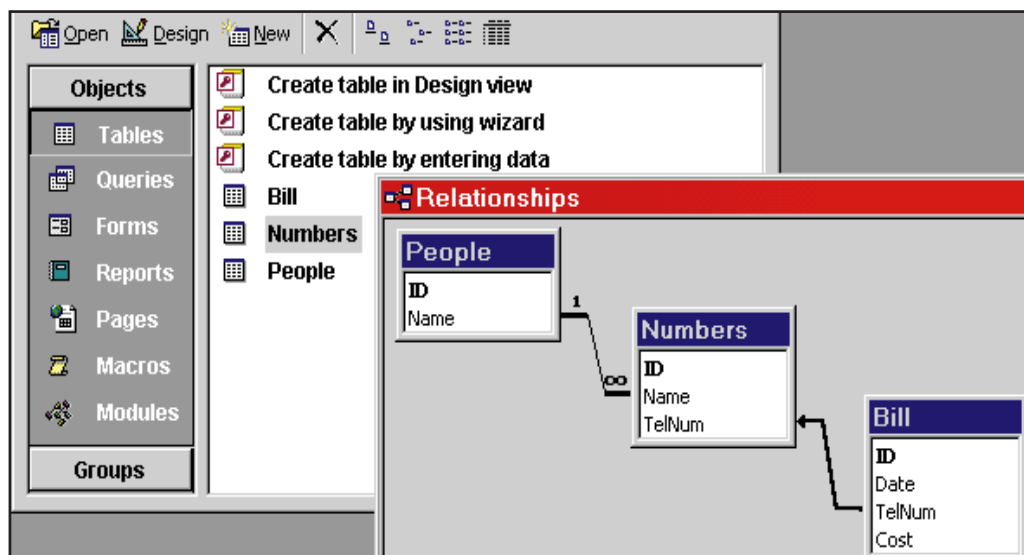
A It must be a bit of drag checking that the OCR has worked accurately, but after that Access makes light work of itemised sub-bills.

As usual there is more than one way to skin a cat, but try this. Set up three tables. The first, People, holds the names of your housemates. The second, Numbers, has a field for phone number and another for the name of the person who calls it. The third table, Bill, takes the data imported from TextBridge and will

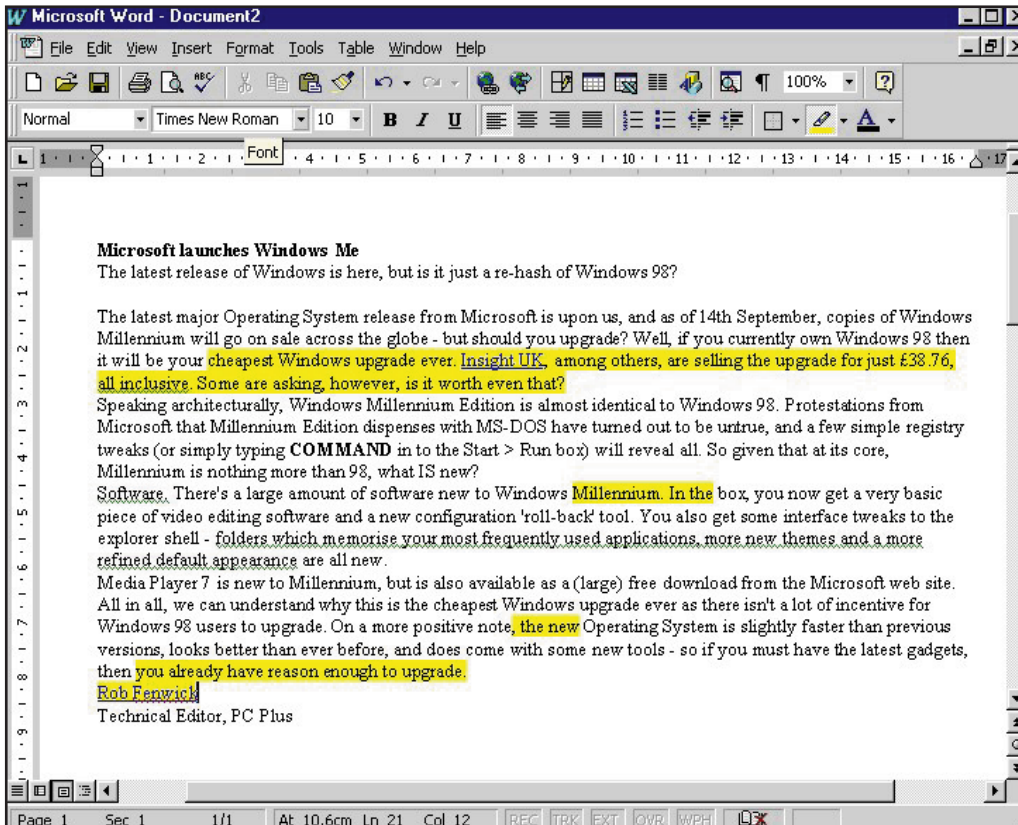
include fields for phone number, date and cost.

These tables are joined as shown in the screenshot, enabling Access to pick out from Numbers all the records belonging to a person selected in People. The phone numbers in these records lead Access to pick out corresponding items from the bill.

To create the joins, go to the Database window and select Tools / Relationships. In the following dialog, double-click each table name in turn to add it to the Relationships window. Close the dialog and drag the tables so that People is on the left, Bill is on the right and Numbers is between them. Drag the name field from the Numbers table and drop it on the



↑ Three tables related as shown enable you to find out who's been racking up what on the communal phone bill.



← Ian finds a faster way of switching between highlighted sections of text.

WhoSpentWhat in the Reports list and a fresh report will be generated.

WORD

Highlight hopper

Q I make great use of Word's highlighter to mark text that I need to come back to for some reason. Is there any way I can quickly jump between sections of highlighted text? The Edit / Go To dialog doesn't seem to include an entry for highlights.
Leena Parry

A Great idea, I thought, and I was about to launch into a heavy-duty macro-based solution when I had a hunch and... yes, there's an easier way.

Press [Ctrl][F] to bring up the Find and Replace dialog. Click More, then Format, Highlight and Find Next. You can now dismiss the dialog and use [Ctrl][Page Up] and [Ctrl][Pg Down] to jump between highlights. Or you can press the double-arrowed buttons near the meeting of the two scrollbars on the lower right.

If you want a button that makes highlighting the browse object (the target of the controls just mentioned) then simply record the process of going through the Find and Replace dialog as a macro. Create the button as described in the question on printer selection.

name field in the People table.

The Edit Relationships dialog will appear. You will probably want to enforce referential integrity, but skip it for now and look it up in the help file at your leisure. You can always come back to the Relationships window, right-click the join line and change the options. Click Create. Now drag the telephone number field from Bill and drop it on to the telephone number field in the Numbers table.

How you present the information is up to you and partly depends on how you want to interact with it. You might want a form which draws together data from all three tables. Alternatively you could produce individual accounts as a

report. In this case you may only have a simple form for each table, or even omit forms and work in datasheet view.

The report is created as follows. In the Database window select Reports and start the wizard. Select Bill in the Tables/Queries drop-down and add the date, telephone number and cost fields to the Selected Fields list. Now select the People table and add the name field. Click Next. Opt to view the data 'by People'. This gives a major heading to each person and groups matching records from the bill underneath.

Click Next, and Next again to leave the grouping levels unchanged. The wizard now offers the facility to

define how records will be ordered.

Select the date field and click Summary Options. The cost field should be listed. Place a tick under 'Sum'. The report will now sum the costs for each person. Click OK and Next. Pick a report layout. In the next part of the Wizard select the look you prefer. At the end of the wizard give the report a meaningful name such as WhoSpentWhat. Close the wizard.

The report should look something like the second grab. You can tinker with it in design view to get rid of unwanted elements, edit labels, change styles and so on. The report can be printed, and of course the definition is saved. All you have to do for future bills is double-click

WINDOWS

Broken shortcuts

We reveal the tricks to fix them



|prog\files\helpdesk\FixLNK\

I wonder what hidden undercurrent is causing people to muck up the file association for Windows shortcuts all of a sudden? For years this question never came up, but now two readers have asked it within a matter of weeks.

The first came from somebody who had managed to associate the LNK extension with the freeware image viewer IrfanView, mentioned in this month's item on wavelet compression. Shortcuts carried the IrfanView icon and, when double-clicked, opened in that program too. The other person had associated shortcuts with a programmers' editor.

You would think you could just go to

the File Types tab in Windows Explorer's Folder Options dialog, and edit the file association back to whatever it should be. If you try that, you will find that it seems impossible to repair the LNK file association.

The other standard tricks don't help much either, but I'll tell you what they are as they work for many other file association problems. The first is to [Shift]-right click on a file of the type you want to re-associate and select Open With. Pick a program, make sure the 'Always use this program...' checkbox is ticked, and open the file. The third way is to go to Start / Run and type 'winfile' into the dialog. This will bring up

the old Windows 3 File Manager. You can reassociate file types from its File menu.

File Manager was included in Windows 95 to ease the transition from Windows 3 which had a different user interface. It's strange that it's still there, even in Windows Millennium Edition. There again, ME resurrects both Qbasic and the long-disappeared MS-DOS help file, so it's in good company.

Anyway, with shortcuts it looks like you have to go into the registry and recreate the relevant entries. These are in HKEY_CLASSES_ROOT\lnk and HKEY_CLASSES_ROOT\lnkfile. Ideally you would be able to export these branches

from the registry of a healthy machine, copy the resulting .REG files to the poorly one, and double-click them to install their contents.

But there is a pitfall: the registry entries vary between versions of Windows and the version of IE installed. I've seen several variations, and there may well be more.

I can't cover every possibility, but on the SuperDisc you will find a selection of .REG files for different set-ups. Consult the file Readfirst.txt to find out which to install. Double-click the one that matches your system. If none match, find someone with the same configuration as you and copy their settings.

→ This freebie from Intel can detect how fast some of its processors are running. It can also confirm whether Windows has its knickers in a twist over CPU identification.

WINDOWS

Mistaken identity?

Q I have a PIII 550MHz working on an SE 440 BX2 Intel motherboard. My BIOS recognises the processor as a PIII 550MHz, but Windows 98 says it is:

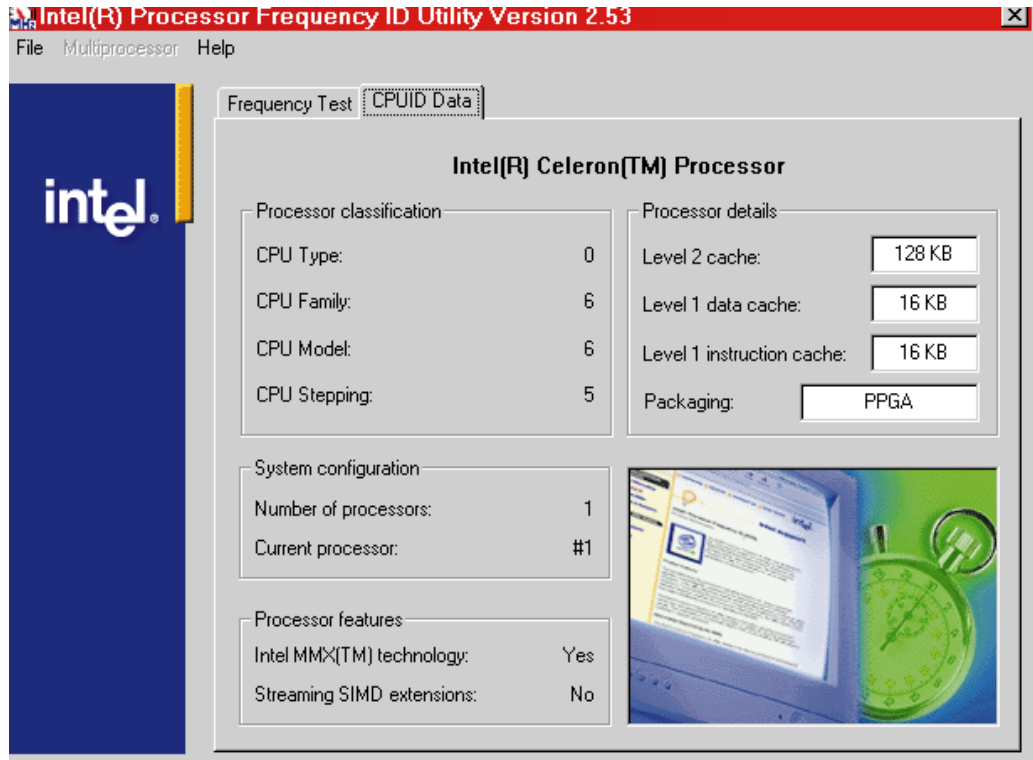
Genuineintel
Pentium(r)II Processor
Intel MMX(TM)Technology

Should I believe Intel or should I believe Microsoft?
Elie Achkar

A Windows is Inspector Clueless when it comes to processor identification.

This shouldn't affect the computer's performance, but it may well eat away at you in the small hours.

If you want to be absolutely sure that your hardware vendor



hasn't pulled a fast one, go to <http://support.intel.com/support/processors/tools/frequencyid/freqid.htm> and download the utility there. It's intended for identifying the operating frequency

of later Intel processors. On processors that don't support this feature (yours should) the program can still pull out the internal identification code and translate it into CPU's the common name.

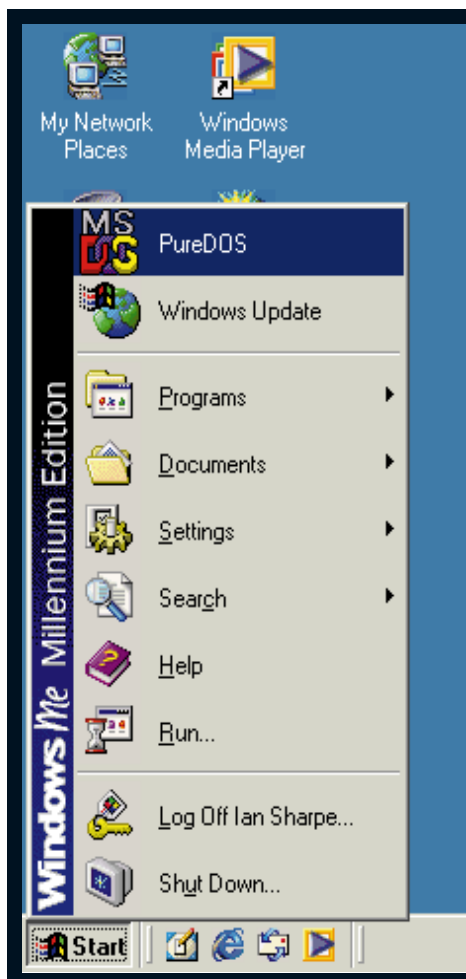
WINDOWS NT

Relocating the printer spool file

Q First let me thank PC Plus for its HelpDesk which has over the years given me a lot of useful knowledge, and for the rest of the excellent mag you are publishing. I just wanted to draw your attention to one little mistake in the September issue, where reader A. Stockton is told that the printer spool file can't be re-located. In fact it can: in Windows 2000 you can change the location in the Registry (HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows NT\CurrentVersion\Print\Printers\DefaultSpoolDirectory). NT 4.0 has a similar entry.

Keep up the good work.
Ivo Kvesic

A For once I can plead innocence. Andy is using Windows 9x (he referred to Autoexec.bat in his letter) where it isn't possible to relocate the spool file so easily. I did know that the situation is different in NT. In fact, since NT 4 the facility to change the default location of the spool file has been present in the GUI. Double-click Printers in Control Panel then File / Server Properties. On the Advanced tab you can type the new path. Registry Editor is still required to override the default location on per-printer basis though. It is also interesting to note that in NT/2000 you can also distribute the



WINDOWS MILLENNIUM

DOS mode restored

There are ways of getting your DOS mode back

It may be a survivor from the Mesozoic whose time is nigh, but the demise of reboot-to-DOS mode in Win Me raised more than a few eyebrows and set more than a few bottom lips a-quiver.

But stay your tears – DOS mode hasn't sunk without trace. Not one, but two ways have emerged to get it back if you don't mind the real risk of being shunned by Microsoft's technical support.

Both involve downloading and running utility programs. The first one I tried works and is the simplest to use, but on close inspection turns out to contain a link to a Web site dedicated to some particularly raw porn links. The author also appears to be involved in cracking commercial software.

Even if you don't care about the ethical aspect of furthering the interests of the person concerned, letting a program with that sort of background loose on your hard disk has to be risky. Who knows what else the code might get up to?

If you download a utility of this type, check for a file called File_id.diz in the package. By itself this means nothing – thousands of programs include a file of that name. Open it in Notepad. If it contains a logo built from text characters including strings of semi-colons and '==[X]=' then you have the one I am talking about. Just say no.

The second solution is a tiny bit fiddlier and you need a Windows 98 CD. However, it does have a respectable pedigree. Find it at www.sgmvp.freewebsites.com/WinME.htm.

← Follow the procedure on SG's Web site, and you can reboot to pure MS-DOS mode from Windows Me. Just run the new shortcut at the top of the Start menu. I'm writing this in mid September and one of the very first Win Me shrinkwraps has just dropped through my letterbox. The material on the Web site currently predates that, so we can't be sure it's fully up to date. I tried the method on the shrinkwrap WinME and it does work, though I haven't tested any of the related items.

swap file over several disks. Knowledge Base article Q123747 has more information on both subjects. Enter the document IDs into the search engine at www.microsoft.com.

WINDOWS

How to make 'how to' movies

Q Some years ago when I first became a subscriber to **PC Plus** there used to be a program for doing your own screen movies with a voice over. Was it Lotus? I am looking for something to make my own little 'how to' movies for teaching mature students various aspects of word processing and spreadsheets. Can you help and point me in the right direction for something that is free and easy to use?

Barrington Hope

A It was Lotus ScreenCam. An earlier version of it appeared on the May 99 **SuperCD** as part of our SmartSuite give-away, but this won't work with Windows 2000. The latest version doesn't either and none is planned according to the Lotus Web site, but there is an NT 4 edition of the program. You can download a 15-day demo from www.lotus.com/home.nsf/welcome/screencam. The product is available as part of SmartSuite or separately.

Microsoft has a program called Microsoft Camcorder which came with Office 97. It's in \Valupack\mscam on the Office 97 CD. It wasn't supplied with Office 2000 and is known to be incompatible with PhotoDRAW 2000. Neither will it record under Windows NT or 2000, though you can replay a movie created on Windows 95/98 and export it as an EXE file.

The key difference between ScreenCam and Camcorder is that Lotus stores a list of the commands sent to the graphic user interface and later replays them, while Microsoft creates an AVI file — an animated bitmap of what happened on the screen. ScreenCam can export an AVI if you want.

If you do not have either program, or you really need Windows 2000 compatibility, you could investigate the following which I haven't tried. All cost money, but not too much aside from Camtasia (www.techsmith.com) which weighs in at \$150. A trial version is available for download. Also look at HyperCam (www.hyperionics.com), Matchware ScreenCorder (www.matchware.net) and WinStructor (www.flickerfree.com/ws.html).

The last two don't claim 2000 support specifically, but Camtasia and HyperCam do. I'm sure there must be others programs available but I don't know of any free options. If anybody does know, please send me the mail and I'll pass it on.



↑ You can download a 15-day demo from www.lotus.com/home.nsf/welcome/screencam.

WINDOWS ME TIP

How to make a bootable floppy in ME

Microsoft tried to hide pure DOS in Millennium Edition, but it's still possible to find it

There are going to be increasing numbers of people who buy computers with Win Me installed and who want the ability to boot up from a system floppy to a DOS prompt occasionally.

If you format a floppy disk from Explorer, the option to transfer system files has been removed. Go to an MS-DOS box and type **FORMAT /S**, and you're old that Windows no longer supports the

/S switch. Instead go to Add/Remove programs section in Control Panel. The Startup Disk tab still does the business. With a bootable floppy you can perform tasks that can't be done or are ill-advised from inside Windows such as flashing your BIOS, though BIOS manufacturers will eventually introduce a system that doesn't require pure DOS.

→ Further help resources

How to get information direct from manufacturers and fellow users



PC Plus SUPER DISC | prog/files/helpdesk/sites/hsnet.htm

If you need an updated driver or other help direct from a manufacturer, first check its Web site. One of the search engines will help you locate it — for example www.google.com, www.northernlight.com or www.mamma.com.

I have compiled a list of Internet addresses of many leading hardware and software manufacturers. It is in the file **hsnet.htm** which you will find on the **SuperDisc** every month. Copy the Sites folder to your hard disk and bookmark **hsnet.htm** for instant access.

If what you want isn't there and the general search engines turn up tons of irrelevant links, try www.service911.com/content/SupportHelp.asp which has a searchable database of tech support contacts. If you find a site I haven't listed but which could be useful to other readers, please drop me a line at ian.sharpe@futurenet.co.uk.

Newsgroups are also a great source of help and advice. It is likely that your question has been asked and answered before, so before posting a message search previous postings at www.deja.com. And don't forget **PC Plus'** own newsgroups at www.pcplus.co.uk.

PCPlus MAILBOX

➔ This month: a surprise bargain from Mesh, ruminations on the X-box and, incredibly, a man who's happy with his lot ...

A fine Mesh

Just a few comments on your Mesh Matrix 700D review in the Nov issue. The reviewer states (not once, but twice) that this computer does not have a Duron chip. However, I believe it does contain a Duron. First, it is listed on page 59 as having 64k of secondary cache (like a Duron). Second, its performance is much more in line with the other Durons in the review (versus the much higher performance of the Atlas machine, which does have an Athlon). Third, the Mesh Web site lists a D700 model as having a Duron. Finally, I would guess that the 'D' in 700D stands for Duron.

I don't normally write into magazines every time I notice a tiny mistake, but in this case, the reviewer was using this as a major point of distinction for the Mesh



interested me. The X-Box is planned to use a specially adapted version of the Windows kernel. If Microsoft lose their court case against the DoJ and are split into two companies - one for operating systems and one for everything else, then the X-Box company will no longer own the rights to any of the Windows operating systems, including the kernel. Since the X-Box company will not be allowed to write operating systems, will they have to pay another company to write another operating system, and if so, will they be able to pay the Microsoft operating systems company to write a console-based version of the Windows kernel? Microsoft would then have to make a choice - admit that the Linux kernel is better than the Windows kernel and use a simplified version of the Linux kernel (which would make X-Box games run more efficiently) or, in true Microsoft style, be arrogant and carry on using the Windows kernel, so as not to admit defeat by the Linux movement.

If the X-Box did use the Windows kernel, would it also use DirectX? This would make it much easier for PC developers to port the DirectX games straight onto the X-Box. Microsoft would have the option of charging royalties for programs using DirectX. As the PC gaming industry has become very dependant on DirectX APIs, could this spell disaster? If Microsoft is to split, which company would continue writing DirectX? It's not technically part of the Windows operating system, however, it is written in order to attract games developers to the Windows operating system. So, why would it be in the best interest of the non-operating system part of Microsoft to continue writing the libraries?

Daniel Newman

Port, anyone?

Mike's article on firewalls mentions ports but not their bindings. I am not a computer buff but came upon a site run by 'Gibson Research Corporation'. A WhizzKid there advocates installing Netbeui for internal networks or maintaining bindings not used. Thereafter removing all bindings to the TCP/IP except DialUp adaptor. IPX/SPX being installed for networking games and also disconnected from TCP/IP. The Gibson

Write to PCPlus

Let us know what you think of the magazine

What do you like (or dislike) about the magazine? What would you like to see? And what do you think about the products and companies in the PC industry? Whatever the answer, we want to know.

➔ Please write in. Short, concise letters or e-mails are much more likely to be used, as life's too short to extract the important bits from a massive submission. We give a Star Letter prize away in every issue, so get those letters coming in.

➔ E-mail is the best way to send your comments. For Mailbox send them to: pcplus.editor@futurenet.co.uk or fax them to: 01225 732295.

➔ Alternatively, print your letter and send to: Mailbox, PC Plus, Future Publishing, 30 Monmouth Street, Bath BA1 2BW.

➔ Every letter will be read by the editor, and the most interesting (not the most complimentary!) letters will be printed and answered on these pages. We reserve the right to edit letters to fit, and the opinions expressed on these pages are those of PC Plus readers, and do not necessarily represent those of the editorial team. Letters and e-mails are assumed to be for publication unless stated otherwise, and published versions of letters become copyright Future Publishing.

➔ We regret that we can't always answer letters personally, but questions of general interest may also be covered in Help Desk.

➔ The Mesh 700D - the D actually means that there is an Athlon.

machine. Anyway, I really like your magazine. Keep up the good work.

Rich Wenzel

PCP Thanks for pointing out the discrepancy. Following this letter, we discovered that Mesh made a small error in putting an Athlon, rather than the intended Duron, into their review machine. The good news is that Mesh has told us it will be selling the machine as reviewed for PC Plus readers. Most honourable.

X marks the box

In recent months I have been following the developments of Microsoft's games console the X-Box. Microsoft are planning for it to be used purely as a gaming platform and not for Internet access, unlike some other consoles which use their ability to connect to the Internet as one of their main selling points. I happen to agree with Microsoft (for once!). I have browsed the Internet with my friend's Dreamcast and I don't see why anyone with a PC would choose to browse the Net with a console which is incapable of downloading anything, has half the screen resolution and can't even use Java.

It is, however, another of Microsoft's proposals for the X-Box that

site offers a service to probe your computer and a small free program for a quick test to probe your ports when online. He also has an issue going with a software provider who obtained his details during a purchase and are now monitoring his downloads and transmitting some of his details back to their site as plain text. I thought these points might be of interest to other **PC Plus** readers,
Barney Smyth

A miracle

Is it me? Am I unique? I use BT Surftime along with their Home Highway package plus Freeserve, and am delighted with it. Speed, connection reliability and even cost seem fair. I bought a new system from Mesh in January. It arrived on the day promised, disks were present for everything loaded. Documentation was superb, and the only problem I have had was due to my own ineptitude and Mesh sorted it over the phone for me. Hell, try as I might I couldn't find a thing to complain about.

I have flatbed, and film scanners, CD Rom drive and re-writable, Zip drive, external HDD, Web cam, Digi camera, 3 printers, more USB than you can poke a stick at and nothing ever seems to go wrong. Except of course I would take pleasure in eviscerating Bill Gates. Most of my bits I buy from Technomatic, again great service. I even have a degree of regard for PC World. Like I said, am I unique? By the way, your magazine is the best of the genre.

Paul Casey

PCP Unique? Well, it's certainly rare for a happy customer to contact us! It makes a refreshing change to hear from someone who is content with their hardware, software and service; if only there were more people who were lucky enough to be in such a position!

Biometric loopholes

Your reader, Owen Berg, points to possible security loopholes in the use of biometric devices used as a means of secure user identification. I have followed with interest some of the various methods used to uniquely identify a user to a computer system.

I appreciate the concern that Owen expresses, that someone may use some technique to intercept the datastream and duplicate this on another occasion. He identifies the ability to change a password as an advantage over the unchangeable biometric signature. However, this misses the possibility of encrypting the biometric data. This would offer the opportunity of effectively having a different password for every single time a password was required. It wouldn't prevent someone capturing the datastream, although there is nothing to stop them doing the same with a user entered password, but with a one time

PRIZE WINNING STAR LETTER

Pure bunkum

To John Robinson from last month's Mailbox: If everyone bought as little new software as you appear to buy we would not have a software industry. If you bought one Ford car every 10 years, would you expect Ford to look upon you as a faithful customer? I must agree about the bloatware, but it does have a built-in programming language to allow automation of common tasks, something that would benefit many companies, if they only knew how to use it.

To Chris Bidmead: After reading your columns in this magazine and others for many years, and enjoying them, I am sad to have to say that this is the biggest load of bunk that you have written. Is it the silly season, or just a wind up? I find your idea that people who finish their daily work should then be allowed to go on the Internet at company expense is somewhat

naive. The reward for working is the pay negotiated with your employer. As for the argument that they are downloading files (for themselves) 'to add a smidging of interest to the daily grind' - what a load of bunk. These people are doing it to save money on their own phone bill. Perhaps the garage mechanic who finishes the service on your car quicker than scheduled should be allowed to go for a ride in your car as 'just reward'?

But what is a day's work? Most people would argue that if you are not doing company work, then you have not done the work of the day. Few companies have a set amount of work to be done, they expect people to do more and more (hence the greater incidence of nervous breakdowns in this modern age).

Perhaps in your line of work, where you are probably employed by yourself, writing a column for

each of the computer magazines, you can decide when you write and when you do not. In the real world, for most working people the contract is that you are at work for 7.5 hours per day, and during those hours you do work stipulated by the company. You do not pick and choose when you will work or how long for. If you want that right, are you prepared to allow your employer to pick and choose when he will pay you?

Back to the mythical employee who completes his work before going on the Internet. From my experience and what I have read in the press recently, the problem is that many employees are not doing their work and go on the Internet during the working day. This is the complaint that many employers have voiced, but the answer to this is in their own hands.

Phillip Marsden

→ WIN A 19-inch TAXAN MONITOR!

Each month we are offering a fantastic 19-inch Taxan Ergovision 975 TCO 99 monitor worth £309 to the Letter of the Month. Perfectly flat from edge to edge, this superb high-resolution monitor with DIAMONDTRON Natural Flat (NF) screen represents a significant advance in display technology, offering accurate, pixel-perfect image reproduction. The Ergovision 975 TCO 99 comes complete with built-in USB hub and meets the TCO 99 environmental labelling standards. For the complete range of Taxan monitors, call 01344 484646 or visit the Web site at www.taxan.co.uk



encrypted biometric signature it would be of absolutely no use.

I'm sure that the manufacturers and developers of biometric identification systems will work very hard to reduce the possibility of any one being able to make use of an intercepted datastream in the manner Owen suggested.

I have been subscribing to **PC Plus** for a couple of years now, after a longish gap. It's nice to see you still maintain such high standards with regard to the software on the coverdiscs. I just wish I had the time to try out a little more.

David Morgan

Do it yourself

On page 115 of the October issue you feature a brief review of Wipe Out! CD repair kit. For readers information, these so-called repair kits (and there are a few of them on the market) are basically no more than metal polish. Brasso and a J-cloth works just as well, and is much cheaper. Of course, if your scratch is more than trivial there is no product that will convert your coaster back into a data store.

Tony Pott

PCP We haven't checked this handy tip out, so Brasso your CDs at your own peril.

Student life

Just a quickie to let you know that I like your new layout. The magazine seems even more packed with goodies. I particularly like your feature this month 'Essential Reading'. As a student I do need to buy reference books and you can't just walk into a shop and browse through until you find something suitable - you have to make a decision and order the book before you see it. Your reviews are very welcome. Perhaps you could do a 'student recommendation'?

Incidentally, I can't find a review of budget digital cameras in any of my back copies. Have you any plans for this? For those of us who need to get pictures on Web pages, but can't afford to fork out £500+ for a camera! Thanks for the magazine - it has been invaluable to me.

Liz Shires

PCP Check out next month for reviews of the best digital cameras, from budget to expert.

LETTERS

Programmers' word #1

I totally disagree with the views expressed by Martin Lowe in his letter published in the most recent issue of **PC Plus**. The programming sections have always been the great strength of **PC Plus** in my view and what make it stand it out from other PC magazines. They are certainly the reason I subscribe. I got my grounding in Delphi from Huw Collingbourne's excellent tutorials and am eternally grateful.

I was beginning to get worried that the programming sections were being sidelined under the last editor, with less space allocated and the contents listing hidden away on a separate page from the other contents. Please, do not let this happen.

Alan Hale

Programmers' word #2

I have to agree with Martin's view of your magazine, that there seems to be too much emphasis on programming and the expert user. Maybe they are the readers you are targeting. Unlike Martin I haven't subscribed yet. I previously have received PCW because of their 'Hands On' feature which covered spreadsheets, word processing etc, however they seem to be cutting back on their spreadsheet feature in particular.

I like the new look and layout of your magazine e.g. **Masterclass** Linux, **Lab test** and **Helpdesk** etc, but I think a section that has tutorials or answer readers specific problems with software that is commonly used e.g. MS Office (Word, Excel...), would be a popular addition. I use Office, at work, because people I deal with people use it and is therefore easier to conform than it

is to go against the grain. That isn't defeatist, it's being practical, some people think a file extension means putting a new drawer in a filing cabinet.

Maybe there is no demand for this type of column, but in my experience people don't know how to use these suites except for there most basic features and learn by trial and error.

Do I subscribe and wait and see or do I look for another publication.....?

Fran Hollywood

Programmers word #3

I am writing in regard to Martin Lowe's letter 'Too Much Code?'. He says he thinks your magazine is too focused on programming, but I disagree, yours is the only magazine that I can find that actually covers decent programming tasks and I am grateful that you do.

I have been reading your magazine for a couple of years and am hooked, not only that, your **Programmers World** section made me think of what I could do. I started writing small things in many different languages and am now a professional Web designer/programmer for a large, well known company. I went to college, but if it had not been for your magazine, I could be a road sweeper! All I can say is thanks, and whatever you do, please don't ditch the programming section, who knows, you might make an army of us. Keep up the good work.

Wesley Twyman

Programmers' word #4

In reply to Martin Lowe (Letters, Issue 169) I have to say that I disagree completely.

PC Plus is my favourite magazine nowadays. In fact, I am cancelling a long term subscription so that I can subscribe

to **PC Plus**. I find your mix ideal for increasing my productive use of computers. I like the fact that you keep me up to date on all the new technologies and let me have a look at the new languages.

It gives me the chance to decide where to invest my time and money. I also like the way you are not afraid to run pieces at different skill levels, especially the beginner and advanced Linux workshops. I think that **PC Plus** is great at helping my professional use of computers because it encourages the reader to take the cover off.

In the past year, it has spurred me on to learning Linux and C++ and I look forward to it advising me in the future. I may not understand all the technical jargon, but I feel I can rely on the contributors to know their stuff. When I read **PC Plus**, it inspires me to learn more and do more. Even though it is one of the pricier magazines on the shelf, I know that I can rely on the editorial and that I am getting my money's worth with the great DVDs. And to top it all, the BOFH! Great! There, is that enough creeping to get a monitor?

Colvin Eccleston

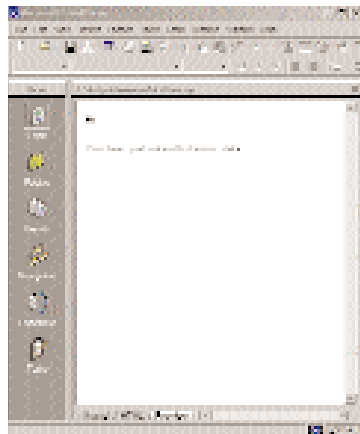
PCP The above four e-mails are just a selection from the massive amount of correspondence we've had about the quantity of programming coverage in **PC Plus**. Broadly speaking, most people seem to think we've got it about right, which is good to hear. However, we're always willing to consider new ideas for sections, projects and tutorials, so please do email if you want to see more of something particular within our pages.

Active Server Pages: PART THREE

A bit of form filling

The ability to interact with the client in a familiar way is useful with ASP.
Paul Warner shows you how

→ If you're using FrontPage you can only preview the HTML code on the client side. The only way to see the results is to view it on your Web server with your browser.



If you've been following the series, you should have a working understanding of how to set up an ASP environment and include a bit of ASP code on the server pages that interact with real-time environmental data, typically date and time. The next step is to look at getting information from the client machine (the user) in a form that the server can use. This could be information from the user such as filling in a form or submitting a password. This information can be gathered from the client machine using standard HTML. The value of each response is allocated to a variable on the server that can be processed by ASP and used to check a password, look up availability of stock or tickets and even at the simplest level personalise your pages to become unique to the particular user.

I'm assuming you've set up something like Personal Web Server on your local machine to test out ASP pages. I won't go into the details of doing this again but if you're not sure how, take a look at the previous couple of issues. If you're not a regular subscriber then backdated copies are available – look at www.pcplus.co.uk for details. For the purposes of this tutorial I'll be using C:\inetpub\wwwroot\default.asp as the default ASP page that's parsed by the server when I open

<http://yourcomputername/>. If you're not certain of your computer name then double click on the Personal Web Manager icon on the right hand toolbar and this should give you all your local information. If you haven't got an Icon then you may not have PWS running. It'll only take a couple of minutes to install. Go to Add/Remove Programs in the Control Panel and make sure that the Personal Web Server box is ticked in the Internet Tools section of the Windows Setup tag. I've found it easier to use FrontPage as my default ASP file editor as it highlights the code, making it easier to view. **PCP**



Paul Warner
pwarner@pcpmag.co.uk

PCPlus

NEXT MONTH

I'll develop a full entry form with error checking and start to look at database connectivity and ways to look up and modify databases held on the server from the client machine

→ Setting up a page to gather information

The simplest way to get information from a client is to input some data into a form

Here I will try some simple HTML code to set up a very simple form:

```
<p>
This is an example of a Form that can be used to
submit data to the Server
</p>

<FORM ACTION="testform.asp" METHOD=POST>
<P><INPUT TYPE = "TEXT" NAME = "TestName"></P>
<P><INPUT TYPE= "SUBMIT" VALUE = "Send Form"></P>
<P><INPUT TYPE= "RESET" VALUE = "Refresh
Form"></P>
```

Looking at this bit of code one line at a time will give us an idea of what's going on. The first line is a simple line of text and shouldn't cause any problem if you've tried some simple HTML code. The next line is the most important. This sets up the Form attributes; the first, ACTION contains the name of the ASP page that will be run when the data is Submitted from this page. The second POST is the Method used to send the data the user has entered into the form to the server. There is another called GET but for the moment we'll stick with POST for simplicity.

The next three lines set up the form control. These consist of a couple of Form tags called SUBMIT and RESET and in this case the Input type TEXT. The first of the three lines sets up this TEXT type and allocates the variable NAME TestName to take the string you type into the form. The INPUT TYPE SUBMIT creates a button below the form that will send the value in held in the TestName field to the testform.asp file on the server. The RESET INPUT TYPE will refresh the contents of TestName so that you can re-enter a new value. This is a very simplistic bit of code but does contain the principles of acquiring data from a form and making it available to the server for use as a variable in an ASP script.

Using the information

Once the information has been returned to the server in a variable, you can use it a multitude of ways to process information and interact with the client. I'll take a simple case of personalising the reply page by returning the information gathered in the opening form. You'll need to create a new file in the same directory as your default.asp file. I've called mine testform.asp. It can be any name you like as long as it is the same as the one you've used in the FORM ACTION declaration in the default.asp file.

Type in the following code in your new file (testform.asp):

```
<html>
<head>
<title>testform</title>
</head>
<body>
<P>Hi </P>
<%
Dim clientsname
clientsname=Request.Form("TestName")
Response.Write clientsname
%>
<P>You have just submitted some data.</P>
</body>
</html>
```

Provided you've entered everything accurately then this page should be called up when you press the submit button on the default page.

→ A simple form is created using our sample code. This enables you to enter some text and submit it to the server for processing or reset the page, clearing the field.

→ Once submitted to the server the ASP code will look return the information gathered in the first for default.asp.

→ If you fail to enter any data and still submit the form, the ASP code will test the value and tell you. This is the basis of an error checking routine that can simplify form filling.



You could develop the code to check for data entry using something like:

```
<html>
<head>
<title>testform</title>
</head>
<body>
<P>Hi </P>
<%
Dim clientsname
clientsname=Request.Form("TestName")
if clientsname = "" then
    response.write "You failed to enter any name."
else
    Response.Write clientsname
end if
%>
<P>You have just submitted some data.</P>
</body>
</html>
```

This builds on the earlier chunk of code by adding a if-then-else check to test the content of the variable clientsname that has been given the value of the TestName collected from the original form when you press the submit button. It doesn't take a lot of imagination to see that this principal can be used to validate users, check availability and generally interact with the user using the data gathered from the form.

Rather than just submitting strings to the server you could send numeric values. For instance when ordering from an on-line store you could select a range of items to be included in your purchase. You may order three pairs of socks and a couple of shirts. The form that is used to collect this information will have variables allocated for each item, the number ordered and the price. These can be processed by the server and return a total value including VAT and delivery charges. You could try out some simple computation over the Web, perhaps a currency converter or perhaps temperature conversion.

With values that fluctuate like currency it would be possible to maintain a database of the latest conversion rates on the server and each time the client machine logged in with a request it could return the very latest rates.

Although the most common Input Types are text, submit and reset. Several other methods are available for sending information from the client to the server. These range from Checkboxes to Option buttons that can be used to set a simple yes/no condition to selection from Lists or Text areas. If a form has been filled out incorrectly then it's better to return to the form with the previous values still intact. This enables you to edit the offending field while retaining the original data. The simplest way to do this is to use an error checking sub-routine to test for each string and check if it has data in it after the data has been retrieved. It's advisable to trim the values retrieved from the client when they are allocated to server side variables as many browsers tend to add a bit of white space to returned values.

The standard VBScript TRIM function would work something like:

```
clientsname=TRIM(Request.Form('TestName'))
```

This could also be used as a method to check and restrict field sizes to a specific length, useful if information is intended for use in a database. VBScript could measure the length of a string variable and ask you to re-enter the data if it's too long.

The error checking routine can send data to an ASP report screen with all the fields listed that were not filled in. It could also contain the value of all the fields that are in the original form. These can be held in 'hidden fields' that hold the value and pass them back to the original field when you return to it. The error checking sub-routine would go something like:

```
<%
SUB reporterror(ErrorText)
%>
<HTML>
<BODY>
<%
response.write ErrorText
%>
<FORM ACTION="testform.asp" METHOD=POST>
%>
<FOR EACH item in request.form
%>
<INPUT TYPE = "HIDDEN" NAME = <%=item%>
<value=<%=Request.Form(item)%>
<%NEXT%>
<P><INPUT TYPE= "SUBMIT" VALUE = "Return"></P>
</BODY>
</HTML>
END SUB
```

Using this type of sub-routine all the data that was entered into the original form would be posted to the page generated on the server and returned back to the original form to rebuild it into the same condition as it was before submission. This may all sound a bit long winded but does make for very slick form filling. I'll put together a bit of code for next month to try this out with a simple application form and see if we can create the basics for an application form to join a mail order list or something similar. Requests or suggestions are more than welcome.

➔ Break the grid lock

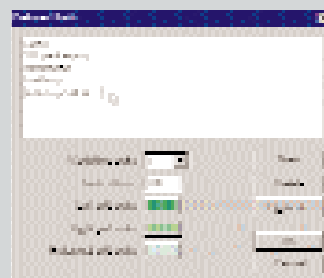
Perspective grids look rough but are easy to customise

MAIN PAGE

By default, the Perspective Grid on a FreeHand page is set up to show the floor and one wall receding into the distance. You can add another two planes as required. The vanishing point can be moved around the page and the planes squashed up or stretched simply by clicking and dragging with the mouse when the Perspective tool is selected.

VIEW MENU

From the View menu, choose Perspective Grid and this submenu will pop up. This is the only way of showing and hiding the Grid itself. You can also restore the graphic back to its original 2D format at any time (Remove Perspective) and break the edited graphic's link completely from the Grid (Release with Perspective).



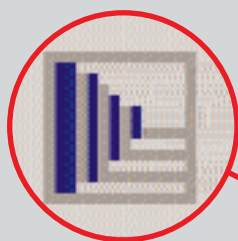
PERSPECTIVE GRID

Although you can view only one grid per document, you can set up as many different Perspective Grids as you like and switch between them. The grids can be named, and based on others by using the Duplicate button.

RESIZING SHORTCUTS

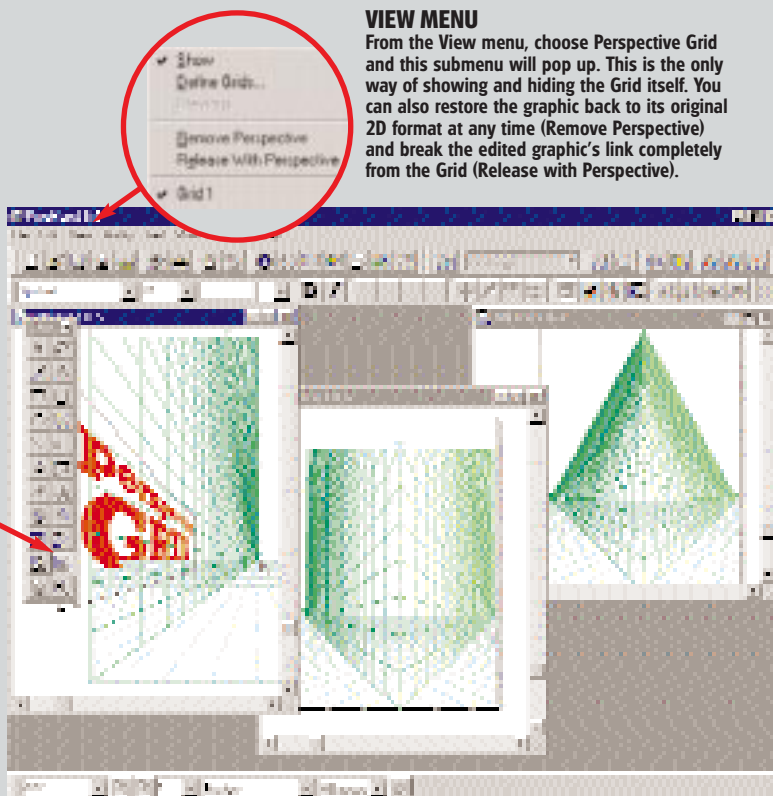
While you are moving an object on a grid, keep the mouse button depressed and tap one of the following number keys to resize it one pixel at a time.

- 1 – shrinks the object, maintaining aspect ratio
- 2 – enlarges the object, maintaining aspect ratio
- 3 – shrinks the object in the X direction
- 4 – enlarges the object in the X direction
- 5 – shrinks the object in the Y direction
- 6 – enlarges the object in the Y direction
- Spacebar – flips the object



PERSPECTIVE TOOL

The Perspective tool is found near the bottom right of FreeHand's main toolbox, just above the Magnification tool. When it is selected, you can toggle back to the Pointer tool at any time by holding down the Ctrl key.



Graphics Masterclass: **PART FOUR**

FreeHand's Perspective Grid in practice

Alistair Dabbs comes up with ideas for using the perspective tools in Macromedia FreeHand 9

When Macromedia upgraded FreeHand to version 9 earlier this year, it received a lot of excited attention. Once the dust settled, many of us woke up to the fact that FreeHand 9's only really interesting new feature was the Perspective Grid. Although it's obviously an extremely worthy feature, a lot of people out there are still scratching their heads over what to do with it. Don't worry if you're one of them, it's only natural.

Obtaining a convincing perspective 3D effect with a 2D vector illustration package can

normally only be obtained by a considerable amount of fiddling with envelopes and shear/skew tools. Or it's done by talented artists who simply draw in a realistic fashion anyway. So after maybe 15 years of avoiding having to draw perspective artwork, it's no surprise that you're wondering what you're going to do with a Perspective Grid now.

The FreeHand tutorials have you putting text on planes that recede into the distance. Great. Then what?

My own view is that the Perspective Grid is the lay designer's chance to muscle in on the big time. It allows you to draw in

simplistic full-face 2D as you always have done, then slap it straight onto a perspective plane.

Start thinking about using FreeHand for product design, mockups and patent diagrams, where you might have considered using a 3D sketching program instead. Here I've used the example of product packaging – it could be breakfast cereal or a toy box or whatever.

Of course, there are limitations: tiled patterns and bitmaps steadfastly refuse to be tweaked into perspective. But the ability of producing realistic 3D views of highly complex vector-only artwork

certainly isn't something to be sniffed at.

FreeHand's Perspective Grid is a killer feature that should spark new life into your drawings. **PCP**



Alistair Dabbs
adabbs@pcpmag.co.uk

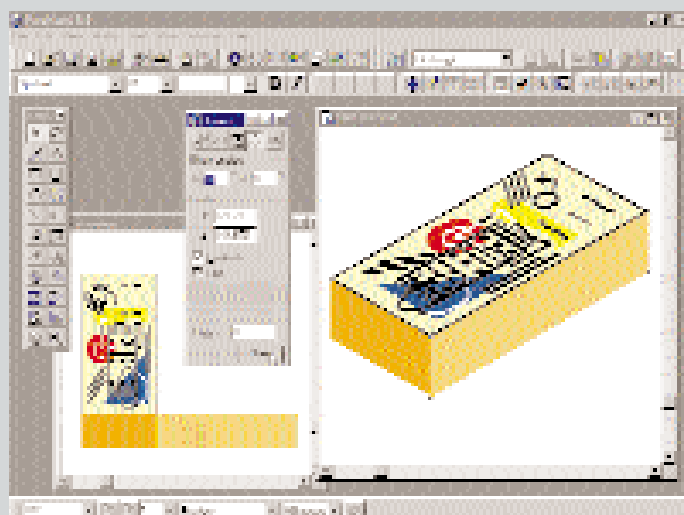
PCPlus

NEXT MONTH

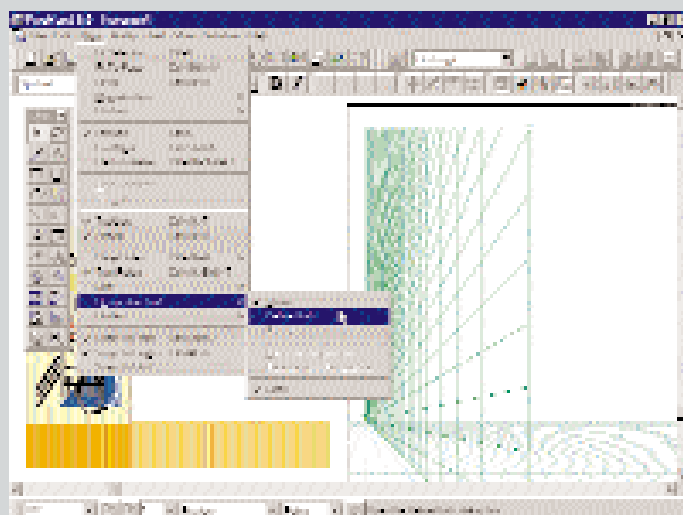
How to keep your Web audience interested while Flash movies download

3D effect packaging

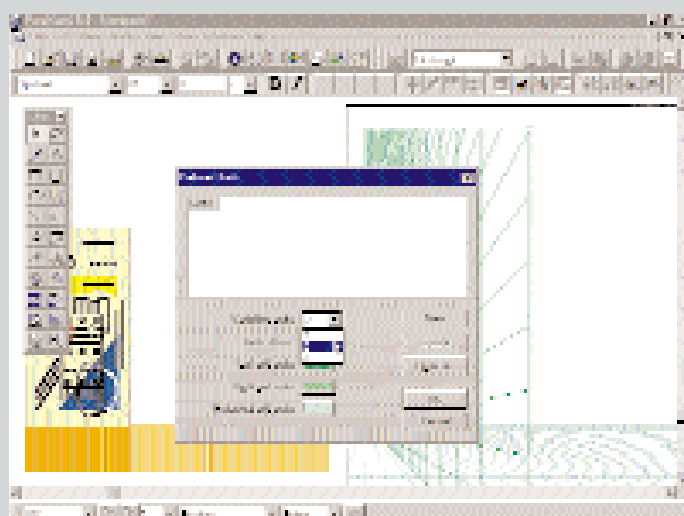
Put an end to isometric cheesiness with realistic perspectives



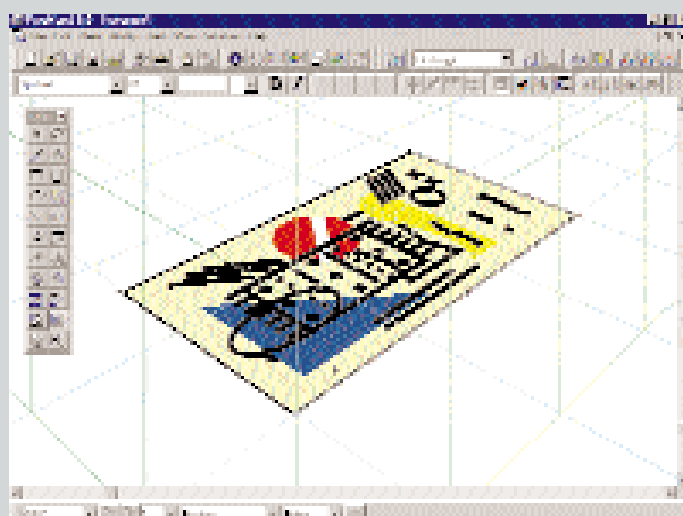
1 This is how you'd normally expect to design packaging and present a mockup using a vector illustration package. Here we've used FreeHand's Transform palette (double-click on any of the transformation tools in the main toolbox) to skew and rotate three flat objects by 30 degrees in various directions and put them together to form an isometric result. It's accurate but not very realistic, and always reminds me of something produced in MacPaint in the 1980s.



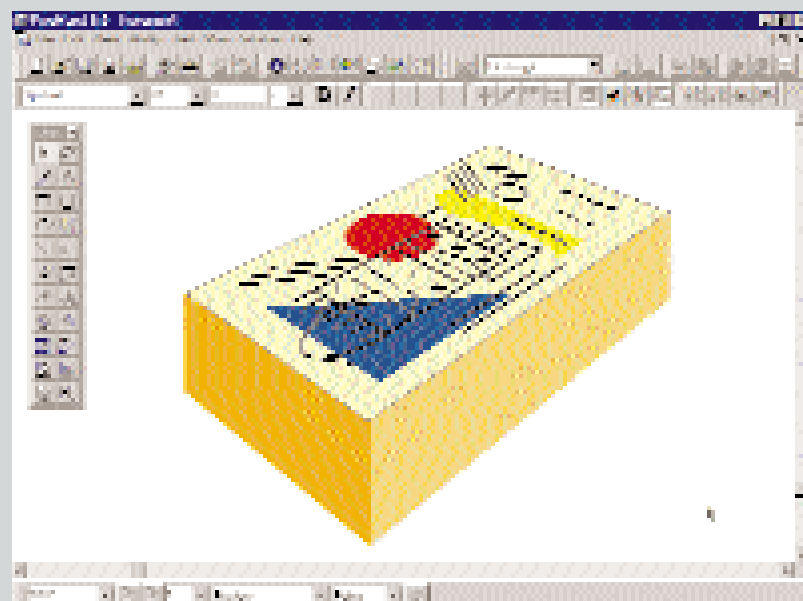
2 Let's go back to the beginning and our three flat objects again. From the View menu, choose Perspective Grid and then select Show from the submenu. A floor and one wall (a right-hand plane) will appear made up from green lines by default. For this exercise you will need left and right planes. Return to this submenu a second time to see the Show item toggled on with a tick, but this time choose the Define Grids... command.



3 The Define Grids dialog window appears. From the Vanishing Point pop-up list at the top (under the list of named Grids which should only read 'Grid 1' for the moment), select '2' instead of '1'. If your artwork is green, it might be a good idea to change the Grid colours from their default greens otherwise you'll find editing extremely confusing. Just click on any of the green boxes to call up a colour selector palette.



4 Click OK when you're ready. Now click on the Perspective tool, select the top face object of your packaging design and while you're still holding the mouse button down, tap the DownArrow cursor key. This applies the object to the floor plane. Release the cursor key and drag the object around as required to get the right effect. If the object shrinks too much (it will), use the resizing shortcuts given at the top of this page.

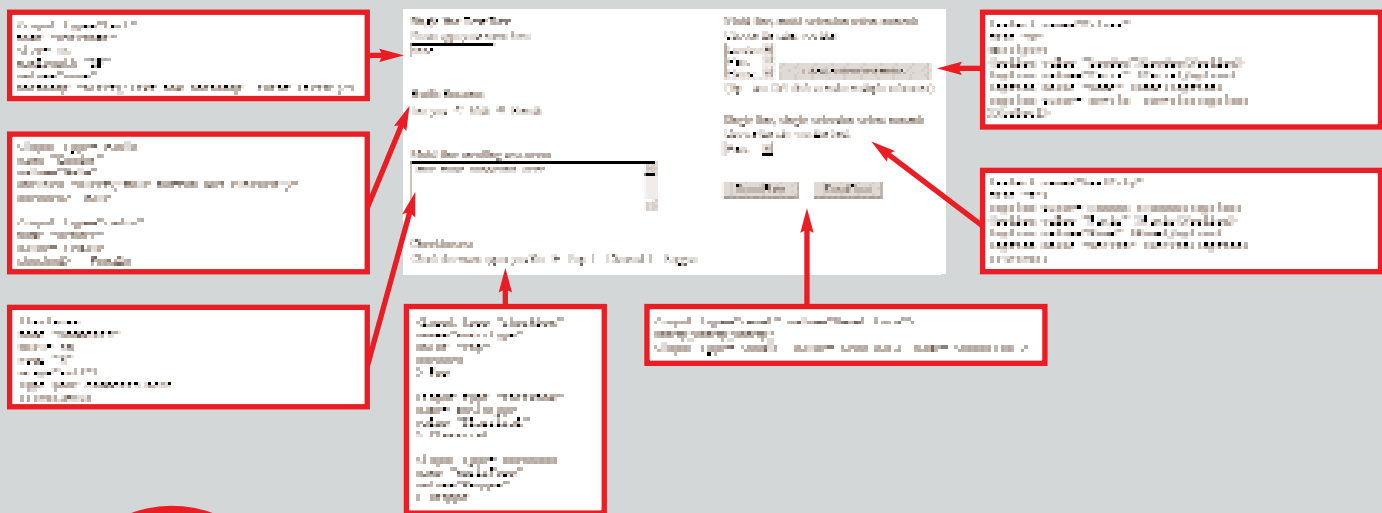


5 Click on one of the side objects of your packaging, keep the mouse button depressed and tap the LeftArrow or RightArrow cursor key as appropriate. You will likely need to edit the object in order to line it up properly with the first object, but the perspective lines will be perfect. Repeat with the third object and toggle off the Grid. Note how it's not just the object shape but the design on the packaging face that indicates perspective realism.

➔ Data entry forms from HTML

HTML tags can be used to create data entry forms

A fairly weird and wonderful set of HTML tags are used to create data entry forms. It's worth learning about them though, as forms are very useful, even if you don't have server-side programming support.



JavaScript techniques: PART FIVE

Data entry forms

Data entry forms are HTML's most important innovation, and they're not just for sites with server-side support. **Paul Stephens** has the details

In my view the most important extension to basic HTML isn't JavaScript, frames or style sheets – it's data entry forms.

Forms let Web pages capture information from users and send it back to the server, without them, there'd be no search engines, e-commerce or dot.com revolution.

Forms were designed to work with server-side applications, but you can do a lot with them even without server-side programming. First, you can send the data captured by a form to another Web document as a 'search string', which is accessible by scripts in the receiving page. Second, you can access form controls (text boxes, radio buttons and so on) from scripts in the same page, making the page responsive to user input.

A `<form>...</form>` tag pair is an HTML container, which can enclose ordinary page content (text, images etc) plus the special tags that define data entry controls. Here's an example `<form>` tag:

```
<form
name="Xform1"
action="receiver.htm"
method="get"
onreset="resetHandler()"
```

```
onsubmit="return(validateSu
bmit())"
target="receiverframe">
```

All `<form>` tag attributes are optional, although you'll normally use at least one. `Name=` creates an identifier via which scripts can access the form's controls (see Netscape Compatibility). `Action=` and `method=` send form data to another page or program; `action=` is the name of the Web page or server-side application to receive the data, and `method=` is either 'get' to send the data as a search string (appended to the page's URL), or 'post' to send it as direct message to an application. A `target=` value loads a receiver page into a named frame or window.

The `onreset=` and `onsubmit=` event handlers are triggered by two special types of pushbutton (see below). A reset button clears any data entered by the user, and restores any default values. A submit button sends data to another page or application (see Sending form data to other pages).

HTML supports six main control types. Here they are, with notes on using them with inter-page search strings and in-page scripting.

Single-line text box

```
<input type="text"
name="userName"
size="15"
maxlength="25"
value="Guest User"
onchange="eventHandler()">
```

The `length=` attribute controls the size (in characters) of the on-screen text box, while the optional `maxlength=` attribute sets a maximum length for the data string, which scrolls within the box. The `onchange=` event is fired whenever the user has edited the text.

Search string – a text control generates a name=value pair, so this example would default to 'userName=Guest+User'

Scripting – the `.value` property of a text field is accessible (only if it is in read/write mode) at all times, for example:

```
form1.userName.value = "New
User"
```

Password controls (`<input type="password">`) behave exactly like text controls, except that they display asterisks instead of the 'real' text.



Hidden controls (`<input type="hidden">`) also behave like text controls, but don't appear on screen; they're used to send data (value=) to other pages via search strings.

Scrolling text area

```
<textarea
name="Comments"
cols="40"
rows="4"
wrap=" soft "
onchange="eventHandler()">
Type your comments here
</textarea>
```

The `cols=` and `rows=` attributes determine the size of the on-screen editing area; the text within the area can word-wrap and scroll. There's no `value=` attribute – instead you put any default value between the `<textarea>...</textarea>` tags.

Search string – single-line text boxes, text areas generate name=value pairs, for example, 'Comments=Type-your-comments+here'

Scripting – Despite having no value attributes, text areas expose

.value properties which are accessible from scripts.

Radio buttons

```
<input type="radio"
name="Gender"
value="Male"
onclick="eventHandler()"
checked> Male
<input type="radio"
name="Gender"
value="Female"
checked> Female
```

Radio buttons work in groups. A series of `<input type="radio">` tags with the same `name=` value form a group. One button can have a `checked` attribute, making it the initially-selected button. It's up to you to supply caption text (as in 'Male' and 'Female' here)

Search string – Each button group generates a single `name=value` pair representing the selected button, for example, `Gender=Female`.

Scripting – there's no single .value property representing the currently-selected button. Instead, the group is accessed as an array of button objects, each with .checked and .value properties. Only one element is checked property can be true at any one time. This JavaScript routine returns the .value of the currently .checked item in a radio group:

```
function
findRadioSelection(radiogroup) {
var i=0, curval="none"
for (i=0; i <
radiogroup.length; i++) {
```

```
if (radiogroup[i].checked
== true) {
curval=
radiogroup[i].value } }
return curval
}
```

You call the function like this:

```
userGender =
findRadioSelection(form1.Ge
nder)
```

Checkboxes

```
<input type="checkbox"
name="Musictype"
value="Pop"
checked
onclick="eventHandler"
> Pop
<input type="checkbox"
name=" Musictype "
value=" Classical "
onclick="eventHandler"
> Classical
```

Checkboxes often appear in groups, but they're independent, so by checking one of the Checkboxes, it doesn't uncheck any others.

Search String – each checked checkbox generates a `name=value` pair, for example `'Musictype=Pop'`. Unchecked boxes don't generate anything, so the search string generated by a form that contains checkboxes will contain variable numbers of `name=value` pairs. As an alternative to same-name checkbox groups, you can use different names (for example, `name='Pop=Yes'`, `'Classical=Yes'`).

Scripting – Checkboxes expose an updateable .checked property. If your checkboxes have completely

unique names, you can access their .checked properties directly:

```
if (form1.Pop.checked)
```

Same-name groups are treated as arrays, like this:

```
if (form1.Music[0].checked)
```

Select controls

```
<select name="Cities"
size="1"
multiple
onchange="eventHandler()">
<option value="0"
selected>London</option>
<option
value="1">Paris</option>
<option
value="2">Rome</option>
</select>
```

`<select>` is HTML's most complex and versatile data entry control. It can be a drop-down list or a multi-line scrolling window, and can allow single or multiple selections. It's not a true combo box, you can't allow the user to type in a value. Inside the `<select>...</select>` container element, you place as many `<option>...</option>` elements as you wish, creating the items in the control's list.

Search string – the control generates a `name=value` pair for each selection, but the example above might yield `'Cities=London&Cities=Rome'`. The text between the `<option>...</option>` tags appear in the list box, but it's the `<option>` tags' `value=` that goes in the string.

Scripting – more array handling. A select control exposes an array called .options, each with .value and

.selected properties. Single-selection controls have a .selectedIndex property which points to the option:

```
carMaker =
carMakers.options[carMakers
.selectedIndex].value
```

With multi-selection controls, you'll need to go through the array to find selected options. Here's a function which returns an array of selected values from any `<select>` control.

```
function
selectedValuesFrom(sControl
) {
var i, j=0
selections = new Array()
for (i=0;
i<sControl.options.length;
i++) {
if
(sControl.options[i].select
ed) {
selections[j]=
sControl.options[i].value
j++}
}
return selections
}
```

You call this function like this:

```
selectedCities =
selectedValuesFrom(form1.Ci
ties)
```

Pushbuttons

```
<input type="button"
name="B1"
value="Click Me"
onclick="eventHandler()">
```

The 'plain vanilla' button is to trigger script code via its `onclick=event`. The `value=` attribute determines the text on the button face.

Search string – plain buttons don't generate search string content.

Scripting – IE lets you place buttons outside `<form>...</form>` containers. You can update a button's .value property at any time.

Input type='submit' buttons send form data to other pages and generate a `name=value` pair in the search string.

Input type='reset' buttons reset the form's contents, and don't generate any search string data.



Paul Stephens
pstephens@pcpmag.co.uk

PC Plus

NEXT MONTH

Taking form handling further with JavaScript

→ Sending data to another page

Forming a new page with the old data

Sending the data from a form to another page is easy, and requires no scripting. The `<form>` tag must have a `method="get"` attribute, and an `action=` attribute that specifies the name of the page to receive the form's data. The form must contain a submit button (`<input type="submit">`); when this button is pressed, the form's data is assembled into the query string, and the receiving page is loaded.

You can validate the form's data via scripts, and if necessary prevent the new page from being loaded. To do this, trap the `onsubmit=` event on the `<form>` tag, or the `onclick=event` handler of the submit button. Scripts can't access the search string; instead they have to access individual controls (see main text). To prevent the new page from being loaded, the event handler code must return a value of false, so if you have a validation function called `'checkForm()`, your `<form>` tag might read:

```
<form
onsubmit="return(checkForm())">
```

RECEIVING

Scripts in the receiving page access the search string via the `location.search` property. Here's a two-item location .search value:

```
?UserName=Jane+Smith&Age=28
```

The string always begins with `?`, then contains a `name=value` pair for each form control that generated a value. The string is escape-encoded (with spaces converted to `+` signs), and it's up to you to unencode it and separate out the individual (variable-length) `name/value` entries – or at least it would be, if we hadn't written the code for you.

On the **SuperDisc** you'll find a sample form page that sends data to a receiver page. The receiver contains JavaScript code for a custom object class, `formDataObject()`. Creating an object of this class automatically processes the `location.search` string, adding arrays of control names and values to the object. So if you say:

```
formData = new formDataObject()
```

you can then say:

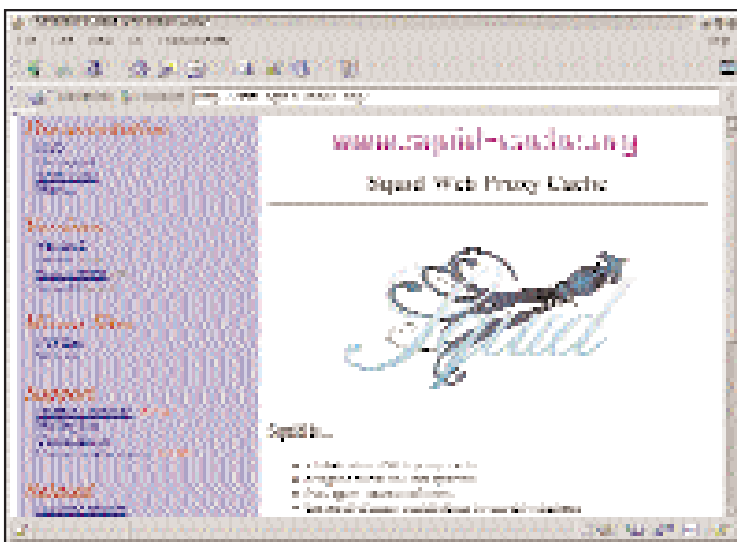
```
formData.dataNames[0]
formData.dataValues[0]
```

and so on.

Getting started with Linux

Caching In On Squid

Maurice Kelly sets up his own proxy server – or eats nautical life, depending on how you look at it...



Way back in the mists of time the World Wide Web was a much smaller place. There was a lot less in the way of graphics intensive sites that ate up your bandwidth with every click of a hyperlink. These days people are aware that they're struggling to download everything they want from the Web, and are resorting to time saving tricks.

One of these tricks is caching. It is most likely that your browser is already caching just about everything you download. When you request a page you have visited before, your browser will compare the document or image in the cache with the remote item. If the remote item is newer it will be fetched, if it's the same as the cached version, no download is necessary.

Many people share an Internet connection with other users, and despite caching by the browsers, Web browsing is still highly inefficient. While each user is caching the documents they view, say, if all users view the same files, it is likely that duplicate

↑ The Squid Homepage is a useful resource with links to documentation and downloads.

downloads will occur. Whether you are a business with a large number of local users, or use an IP-masqueraded network for just a couple of users, you will invariably find that some people will be downloading the same documents at one time.

What is needed in a scenario such as this is a central Web cache, or proxy server. Fortunately there is such software available out there, and this month I'm going to discuss using the Squid cache software to fulfil the role of proxy server. **PCP**



Maurice Kelly
mkelly@pcpmag.co.uk

PCPlus

NEXT MONTH
Back into to the world of GUIs and exploring more graphical applications

→ Getting Squid

Downloading the same documents as other local users is easier with a proxy server like Squid

If you're lucky, you'll have squid installed already – if not, follow this and we'll find it together. The first place to check is your distribution CD-ROM. Your distribution will have pre-compiled packages, startup/shutdown scripts, and may even be configured for use straight out of the box. Of course, not all distributions will feature Squid, or the version may be old and contain bugs, which have since been fixed. The latest stable version is 2.3.STABLE4 so if your distribution isn't reasonably close, then it's download time.

If you haven't got a suitable package, or you prefer to compile from source, then you should go to www.squid-cache.org/Versions/v2/2.3/ and download the latest source package. Open the tarball and enter the source directory. Run the 'configure' command, remembering to tell it where you want to install Squid to – I recommend /usr/local/squid:

```
$ ./configure --prefix=/usr/local/squid
```

When configure is done, build the software using 'make' and then install it using 'su -c make install' (you will need the root password for the installation stage.)

CONFIGURING SQUID

Once Squid has been installed it is time to edit the configuration file. The location of the file 'squid.conf' will be dependent on how you installed Squid. Installing from source produced /usr/local/squid/etc/squid.conf, whereas the Squid package with our Red Hat distribution produced /etc/squid/squid.conf. If you want to know where the package has deposited your configuration file you should issue the command

```
$ rpm -ql squid | grep "squid\.conf"
```

The default squid.conf is quite a large file, but it doesn't have to be complex. Many of the options will be commented out as they represent default values. In fact, it is possible to start Squid at this stage without modifying the configuration, but I'll take a look at a number of pertinent options that are worth considering before diving straight in.

An important consideration for caching is the amount of resources to use. A proxy will require disk space for long-term storage, and memory for short-term storage. If you are running a dedicated Web proxy serving many users, then this doesn't require a lot of consideration – simply assign as much space as you will need (allowing enough resources left over for the operating system to function properly.) If your proxy machine has other purposes you will need to think a bit harder – over allocate resources to Squid and you will choke the machine.

You also need to bear in mind the location of your disk cache. It is a good idea to keep the disc cache on a separate partition (or even a separate hard-disk) so that it can't impinge upon other areas of the file system (this is a general rule of thumb for any task where disk usage is likely to increase unmonitored – for example, news and mail spools, home directories, logs, and so on) For information on using a separate partition for the task see the box Adding More Disk Space.

The configuration option (or Tag in Squid-speak) which specifies the disk cache is cache_dir – the default configuration is:

```
cache_dir ufs /usr/local/squid/cache 100 16 256
```

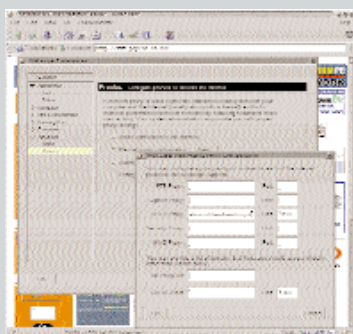
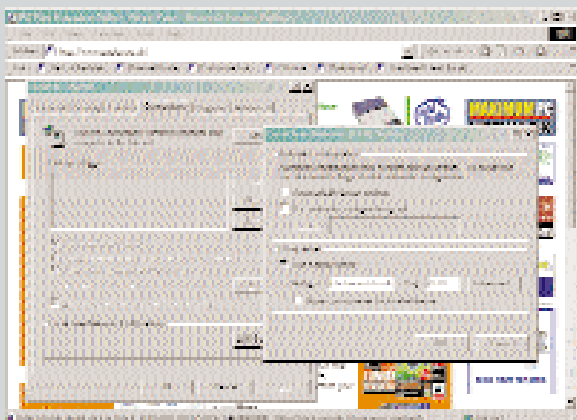
The second parameter 'ufs' is the type of storage system to use – leave it as ufs. The third parameter is the actual location of the cache – you should have decided where to put the cache, making sure it's on a fast disk with enough space. The fourth parameter is the amount of disk space to use – the default is 100MB, and while this may suit some people, it's a good idea to change it. Too small an allocation will cause documents to be swapped out of the cache more frequently which reduces the effectiveness of the proxy. The last two parameters are concerned with how the cache is split up into subdirectories. These are best left as the defaults of 16 and 256.

The tag which determines memory usage is cache_mem and has a default of:

```
cache_mem 8 MB
```

This defines a memory usage of 8MB. Note however that Squid will take more memory than this if the proxy server gets too busy. The Squid documentation recommends that you divide the amount of memory you want to devote to Squid by 3 (for example, if you want to use 9MB then you should specify 3MB instead.)

Squid has security built in which allows an administrator to restrict the use of the proxy (for example, to stop external users using your cache.) The



↑ Proxy configuration for Internet Explorer...

← ...and for Netscape Navigator.

default setup of Squid is quite secure so you will probably need to allow the users on your network to use the cache. To do so you need to set up an Access Control List (ACL) for your local network. In my case, the local network is 10.0.0.0/24 so I want to define an ACL of:

```
acl local_net src 10.0.0.0/24
```

Add a similar entry to your own squid.conf (you should find a number of lines beginning acl and so you should add yours there, too.) That is the ACL defined – now we have to tell Squid to use it. To do so we use the http_access tag. Look through your configuration file for the http_access section and note the http_access deny all entry at the end. Before this line we want Squid to know that we wish to allow access to the ACL we defined above. I achieve this by inserting the line:

```
http_access allow local_net
```

Insert a similar entry in the icp_access section (icp_access allow local_net) and your configuration should be complete.

STARTING SQUID

Before you run Squid properly you will need to create the swap directories for the cache. This is done by executing the squid binary with the -z option (as root, of course.) Your squid binary may not be in your path, so you may need to specify the full path:

```
# /usr/local/squid/bin/squid -z
```

You are now ready to start running your proxy server. There are a couple of ways to go about starting up Squid properly. If you installed from a package that came with your distribution you may have been provided with an init script – have a look in /etc/rc.d/init.d, /etc/init.d or /sbin/init.d for a script called squid. If it exists then execute it with the start option:

```
# /etc/rc.d/init.d/squid start
```

If you compiled from source then you should start the squid binary directly (as you did when creating the swap directories, but drop the -z option.) You don't need to background the process as Squid will do so by itself. It immediately spawns a child process, which actually handles cache requests – if the child dies the parent process will start a new process to keep things ticking over.

By now Squid should be up and running and waiting for connections. Of course, it's not always so simple and you may find that Squid dies because there's something amiss. At this point, it's a good idea to start reviewing the log files. Squid has three logs but the one I'm interested in is called cache.log. Check the end of this file for details as to why Squid didn't want to run.

→ Adding More Disk Space

Keeping cache directories separate

→ The Cache Manager is a CGI script that comes with Squid. Copy it into a cgi-bin directory and access it to remotely monitor the proxy.

It's smart practice to keep your cache directories on a separate partition, or even a separate hard disk drive. If you have a free partition (say /dev/hdb1) that you wish to join onto your main file system it's an easy task to mount the file system:

```
# mount -t ext2 /dev/hdb1  
/mnt/point
```

/mnt/point is the mount point where the new partition should appear (for example, /var/spool/squid/cache.) You could now edit

the cache_dir tag in squid.conf, and then re-create the swap directories using squid -z. Of course, next time the machine needs re-booting, Squid will start up and not be able to find the swap directories as the file system was not re-mounted at boot time. To have a file system remounted at boot time you should add a line such as the following to your /etc/fstab file:

```
/dev/hdb1  
/var/spool/squid/cache ext2  
defaults 1 2
```



www.pcplus.co.uk/forums/linux

Once you have eradicated any problems that may be stopping Squid from running it's time to try it out. Squid has its own program for testing the proxy called client:

```
$ /usr/local/squid/bin/client  
http://www.pcplus.co.uk/
```

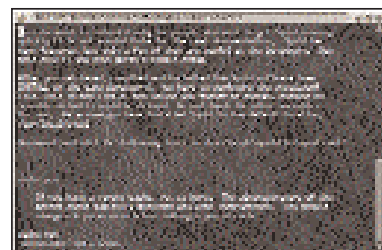
The HTML behind the main **PC Plus** page should be dumped to your terminal after a brief pause – if so your proxy is working, otherwise check the logs again. To see the cache in action repeat the above command; you should notice a speedier response due to the page being fetched from the cache. You are now ready to tell your users that the proxy is available. Details on setting up browsers to use the proxy are available in the box Everyday Usage. An important thing to remember is that Squid defaults to listening for requests on port 3128 (although you can change this in the configuration file if necessary.) Squid is a powerful piece of software, and is highly configurable. I've given a basic configuration above, but it's worth having a read through the comments in squid.conf and learning a bit more about the commands. For more information on Squid I recommend the Squid FAQ (www.squid-cache.org/Doc/FAQ/FAQ.html) and the Users Guide (<http://squid-docs.sourceforge.net/latest/html/book1.htm>).

→ Everyday usage

There's no point in running a proxy server unless you tell your Web browsers to use it. For Internet Explorer 5 users, you should select Tools | Internet Options, then in the Internet Options dialog choose the Connections tab.

At the bottom select the LAN Settings button, and in the Proxy server panel tick the Use a proxy server box, and enter the address of your proxy. The standard proxy port for Squid is 3128. Click the okay button and you're now ready!

For Netscape 4.x select Edit | Preferences, expand the Advanced tree and select Proxies. Set the radio button to Manual proxy configuration, and press the View... button. For HTTP set the proxy server name and set the Port to 3128, then OK everything. Other browsers that support the use of a proxy should follow a similar procedure.



↑ Look for a file called **QUICKSTART** (in your Squid docs or the source tarball) for some useful advice on getting started.



Expert Linux

Wrapping it up

In the final part of this series covering PHP and MySQL, **David Coulson** wraps it all up, and hits the command line



We've looked at various SQL queries as well as a number of the functions provided by PHP to perform MySQL operations, in previous issues, but constructing a functional, and efficient, PHP-based application is still a little out of our reach. PHP is a scripting language, like Perl, Python or even bash, although it differs from most as it can be compiled directly into Apache. Most people forget that you can use it for creating little command line driven scripts, which PHP is almost ideal for. It has far more features than bash, but it's not as difficult as Perl or Python for really basic stuff.

First off, we need to build PHP as if we were going to use it for a CGI. If you've already built PHP into Apache, simply open up config.status and use the ./configure line to setup the build process, making sure you remove any apache or apxs references. Compile and install, and you'll find a binary called 'php' in /usr/local/bin. Testing is really simple to do, as it will compile anything you send to standard input when it's running. Just run './usr/local/bin/php' and type

```
<?php
print time();
?>
```

then press Ctrl-D and it'll spit out a very long number beginning with a 9. If you make a mistake you will notice that the error output is still consistent with a web interface, as that it uses
 and and such like, but there is very little we can do about that. You will also notice that it spits out a HTTP header, which looks rather messy. Fortunately, we can suppress this using the -q switch on the php binary and make it look far more presentable. **PCP**



David Coulson
dcoulson@pcpmag.co.uk

PCPlus
NEXT MONTH

DNS can be a real toughie, so I'll walk you through it step by step

→ Building an application

Keep your contacts handy with our simple address book application

We're going to construct a little command line driven address book. Nothing spectacular or fancy, just an easy to use database of contact details.

First off, we need to construct our database. We're going to keep using our 'Web' database from previous issues, so we can connect to the MySQL server in the usual way;

```
mysql -uWeb -pWebApp web
```

We then use the following table specification

```
CREATE TABLE contacts (
  id INT UNSIGNED NOT NULL auto_increment,
  name TINYTEXT NOT NULL,
  address TEXT NOT NULL,
  email TINYTEXT NOT NULL,
  phone TINYTEXT NOT NULL,
  fax TINYTEXT NOT NULL,
  notes TEXT NOT NULL,
  PRIMARY KEY (id),
  UNIQUE id_idx (id),
  KEY email_idx (email(10)),
  KEY name_idx (name(10));
```

As for the script; as we want it to be directly executable, we start it with

```
#!/usr/local/bin/php -q
```

so we don't need to explicitly specify that it should run through the PHP interpreter. Just like a web based script, we need to enclose the script within <?php and ?>, so it knows what to execute and what to just print out.

The first thing we need is a database connection, via mysql_connect.

```
$dbh=mysql_connect("localhost","Web","WebApp");
```

Now, if it can't connect to the database server, we need it to tell us exactly what's happening. The MySQL API in PHP provides us with the mysql_error and mysql_errno functions, which return the textual and numeric identification for the error caused by the previous MySQL operation. For example, if I try to use mysql_select_db("table"), but am not sure if it actually exists, I could do;

```
mysql_select_db("tablename");
echo mysql_errno().": ".mysql_error()."\n";
```

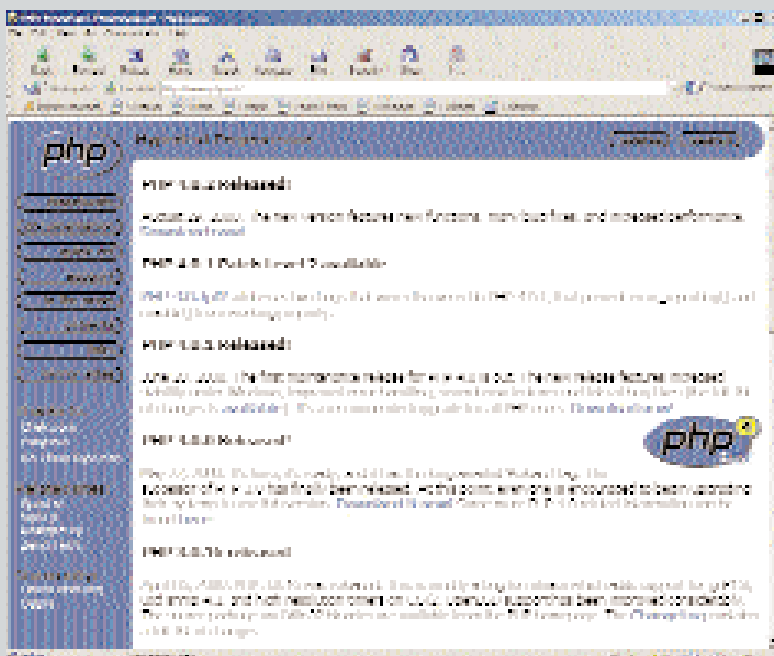
Our script will take an unlimited number of command line arguments. Either 'find' or 'add', then a single string used for searching for a person. If I wanted to search for 'Joe Bloggs <joe@bloggs.net>' I could do

```
./contact.php find joe bloggs.net
```

and it would look for any reference to joe and to bloggs.net in the database. The command line arguments are held in the \$argv array within the script, so we first need to check what the first value is. Within the array, the zeroth value is in fact the name of the script, so we need to start with the element with the key of 1.

```
if($argv[1]=="find") {
  find_contact();
} elseif($argv[1]=="add") {
  add_contact();
```





↑ Use PHP scripting to build a personal address book and search for e-mail addresses, a specific name or telephone number and never lose contact with friends again.

Code Corner

Name search

By using PHP coding, you'll be able to find that long lost friend

```
function find_contact() {
    Global $argv;
    if(count($argv)<2) {
        print "You need to specify one or more search
        parameter\n";
        return 0;
    }
    $query="";
    for($n=2;$n<count($argv);$n++) {
        $q="(name LIKE \"%".$argv[$n]."%\" OR \"
            \"address LIKE \"%".$argv[$n]."%\" OR \"
            \"email LIKE \"%".$argv[$n]."%\" OR \"
            \"phone LIKE \"%".$argv[$n]."%\" OR \"
            \"fax LIKE \"%".$argv[$n]."%\" OR \"
            \"notes LIKE \"%".$argv[$n]."%\"";
        if($query=="") {
            $query=$q;
        } else {
            $query=" AND ".$q;
        }
    }
    $query="SELECT * FROM contacts WHERE ".$query." ORDER BY
    name ASC";
    $result=mysql_query($query);
    $num=mysql_num_rows($result);
    if($num==0) {
        print "No results found\n";
        return 0;
    } else {
        while($row=mysql_fetch_array($result)) {
            print("Name: ".$row[name]."\n".
                "Address: ".$row[address]."\n".
                "Email: ".$row[email]."\n".
                "Phone: ".$row[phone]."\n".
                "Fax: ".$row[fax]."\n".
                "Notes: ".$row[notes]."\n\n");
        }
    }
}
```

```
} else {
    print "Unknown operation\n";
    exit;
}
```

Our find_contact() function is going to be fairly simple, as it just needs to go through the list of arguments, search, and return any entries. (See Code corner.)

The add_contact() is a bit more complicated, as we need to be able to handle user input. User input is generally handled via stdin on the command line, and PHP is no different. We use fopen() to open the special file 'php://stdin', which as you might expect, is internally handled by PHP. Output is still handled by 'print', so we just need to combine them to provide a simple user interface for adding contacts.

First, we need to make a function which reads stdin until the Enter key is pressed. However, we'll also get the new line character added on the end, so we use trim() to remove any leading while space and the line break at the end.

```
function read_stdin() {
    $fd=fopen("php://stdin","r");
    $line=fgets($fd,1024);
    fclose($fd);
    trim($line);
    return $line;
}
```

Then for the actual contact addition function;

```
function add_contact() {
    print "Name: ";
    $name=read_stdin();
    print "Address: ";
    $addr=read_stdin();
    print "EMail: ";
    $mail=strtolower(read_stdin());
    print "Phone: ";
    $phone=read_stdin();
    print "Fax: ";
    $fax=read_stdin();
    print "Notes: ";
    $notes=read_stdin();
    $result=mysql_query("SELECT * FROM contacts
    WHERE email='".$mail."'");
    if(mysql_num_rows($result)>0) {
        print "A contact with that e-mail address
        exists already\n";
    } else {
        $query="INSERT INTO contacts \"
            \"VALUES(0,\"
            \"\".addslashes($name).\"\",
            \"\".addslashes($address).\"\",
            \"\".addslashes($email).\"\",
            \"\".addslashes($phone).\"\",
            \"\".addslashes($fax).\"\",
            \"\".addslashes($notes).\"\"";
        mysql_query($query);
    }
}
```

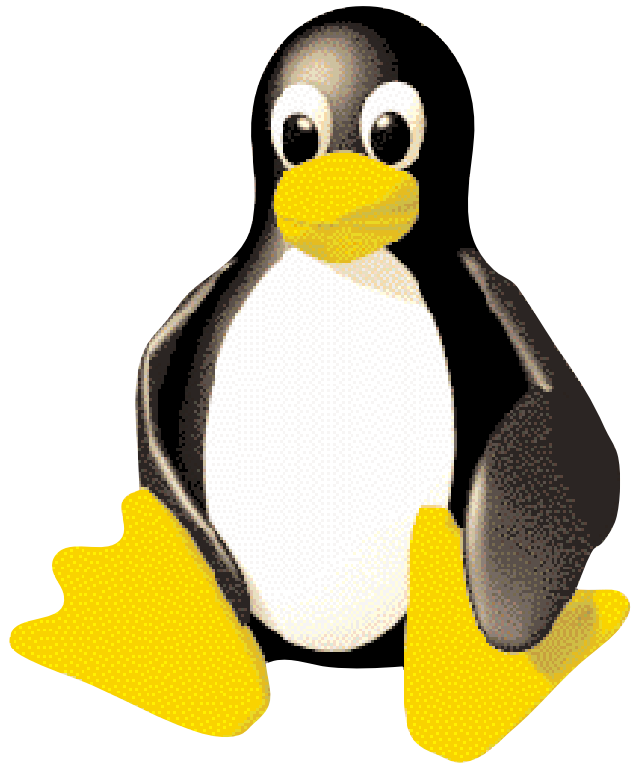
It may be basic, but it wouldn't be difficult to extend the script so you can search for a specific name or e-mail address by checking the value of \$argv[2], then adjusting the search loop to start at the forth element, \$argv[3]. Further values for \$argv[1] provide the means for removing/changing entries, or generating .addressbook from the data.

PHP is a far more useful tool than people realise, as it's significantly simple to use. Of course, if you used to Perl, then additions such as LWP and Mail will be missed, but there are a number of libraries, such as PHPLib, which you can use to provide similar functionality. The only major problem with PHP is that the binary, at a rather excessive 2.7Mb, takes a little while to load, which makes it next to useless for scripts which are executed frequently, such as a mail filtering program. If you need to be able to do that, you'll have to go and learn perl or python.



Your Linux questions answered

Got a Linux query? Our expert **David Coulson** is on hand to solve your problems



Accessing

Q I have installed Linux Mandrake 7.0 on my computer and I have just installed StarOffice 5.1. While I can access this when logged in as root, I can't find any way of accessing and using this when logged in as a user.

Can you please give me an idea how this can be accomplished?
Mr D Pitchforth, by e-mail

A If you want to be able to use StarOffice as the user who didn't install it, you need to do a network installation of it.

First, remove the installation for the root user, by deleting the Office51 directory within -root/. Then untar the StarOffice installation tarball and do

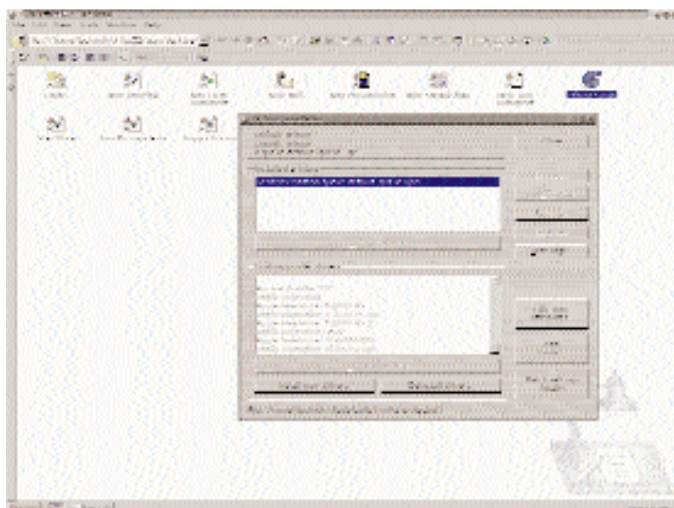
```
./setup /net
```

then install it in /usr/local/office51, or wherever you install programs such as this. Once it's installed there, you can run

```
/usr/local/office51/program  
/soffice
```

as a normal user, which will install a small amount of the program in ~/Office51. After it has finished, you can run the binary again as the user and it will function as normal.

Bear in mind that global configuration options, such as printer or language settings must be done as root for them to appear in the settings for all users.



↑ Why run a Windows application under Linux when you could run a custom built Linux compiled office suite? WordPerfect Office vs StarOffice.



www.pcplus.co.uk/forums/linux

Backing up

Q I want to back up the contents of my home directory to a zip disk through an external zip that may or may not be connected, and have it compressed. This would all be done when either logging out or shutting down the system (whichever is easiest). The problems, however, are that the drive might not be connected as this is on a laptop, and so I don't want any crashes stopping me from shutting down if there is no drive, and I would ideally want it to be done invisibly, except for a 'backup of Home' [OK] type message during shutdown.

Another problem is that only root can mount disks, and I would not be shutting down as root, just a normal user.

Tommy, pcplus.linux

A Not asking for much, are you?!

If you want something to run when you shutdown, you need to have it execute when you enter runlevel 6. It doesn't matter who shuts the machine down, as the scripts will be run by init, which runs as root. Create a script called S90homebackup in /etc/rc.d/rc6.d/, starting with #!/bin/sh and it will execute all of the commands in the script, then exit, so the shutdown will carry on as normal.

The failure of the mount can be used to identify if the drive is connected using something like;

```
mount /dev/zip /mnt/zip ||  
exit 0;
```

where the script will just exit when the disc can not be mounted.

Then, you can have it tar up your home directory, copy it to the disc and unmount. The message can be accomplished using echo to print out a little statement, although you might want to look in /etc/rc.d/init.d/functions to see how to use colours within the echo statement, so it's easier to identify when the backup failed.

If it doesn't exit or go into the background automatically, the machine will be next to useless, as the terminals won't start up.

Incidentally, running 'apachectl start' is the best way to start Apache, as it performs checks on the configuration automatically. You may be able to get away with symlinking the apachectl file into the init.d directory, although it won't display the start/stop status information properly without a little hacking.

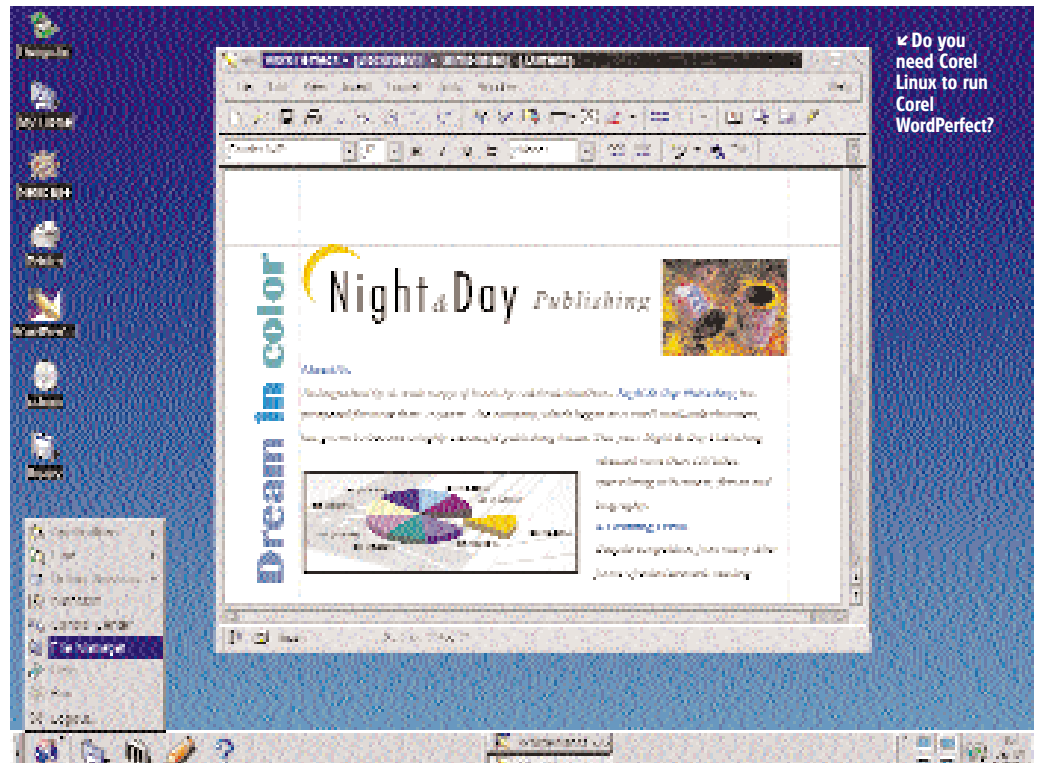
Applications

Q I am a Corel user – WordPerfect 2000, Paradox 8, Draw 8 and Ventura 8 – on a Windows 98 platform. I am very interested in Linux. My question is: if I change

to the Linux OS, will I have to purchase the Linux versions of these programs or will they run under Wine or will they need the customised Corel version of Wine to run satisfactorily?
I Hull, by e-mail

A Corel has released a number of applications including WordPerfect and Office for Linux, but they are just the Windows binary running under Wine. How well they run depends upon your machine specification, but they are generally stable enough to use. When Corel changed Wine so it could run its programs under it, it had to submit the patches for Wine it made back to the original creators, as Wine is released as a GPL package. As well as Wine works for some applications, other more complicated programs drop dead at the first sign of action. Getting Wine up and running isn't the most straightforward thing, as Corel has built a nice little installer into its releases, but once you get it up and running, it's easy to run a windows binary from your Window partition mounted in Linux.

That said, there are native Linux alternatives for the majority of the programs you need. StarOffice or Applixware have general office capabilities, including Word processing and spreadsheets, and there is the excellent GIMP which you can use for graphics. It may take a bit of time to learn how to use the new programs, but it will be a lot easier in the long run, than



Do you need Corel Linux to run Corel WordPerfect?

trying to force something to do what it's not supposed to.

As a last resort, you could always dual-boot Windows and Linux.

Daemons on boot-up

Q This is probably a simple question, but how do I get Apache to start as a daemon when I switch my machine on? I'm running SuSE 6.4, and have Apache setup fine with PHP & MySQL, but to start it I need to enter `/usr/local/apache/`

bin/httpd start once I've booted my machine up. How do I get it to start on boot-up?
BarryM, e-mail

A There are two ways of running a program at boot time. The first, and most complicated, is to write yourself an `init.d` script, which goes in `/etc/rc.d/init.d` or `/etc/init.d`, and is symlinked into the `/etc/rc.d/rcX.d`, where X is the run level which the program starts/stops at.

RPM installations of Apache come with such a script, so you may want to download the SuSE RPM and adjust the script to suit your setup.

The second way is a great deal simpler, but it doesn't give you as much control over the starting and stopping of the program. Open `/etc/rc.d/rc.local` in an editor and add

```
/usr/local/apache/bin/httpd  
start &
```

to the end.

Remember to put the `&` on the end, as if the program you run doesn't exit or go into the background automatically, the machine will be next to useless, as the terminals won't start up.

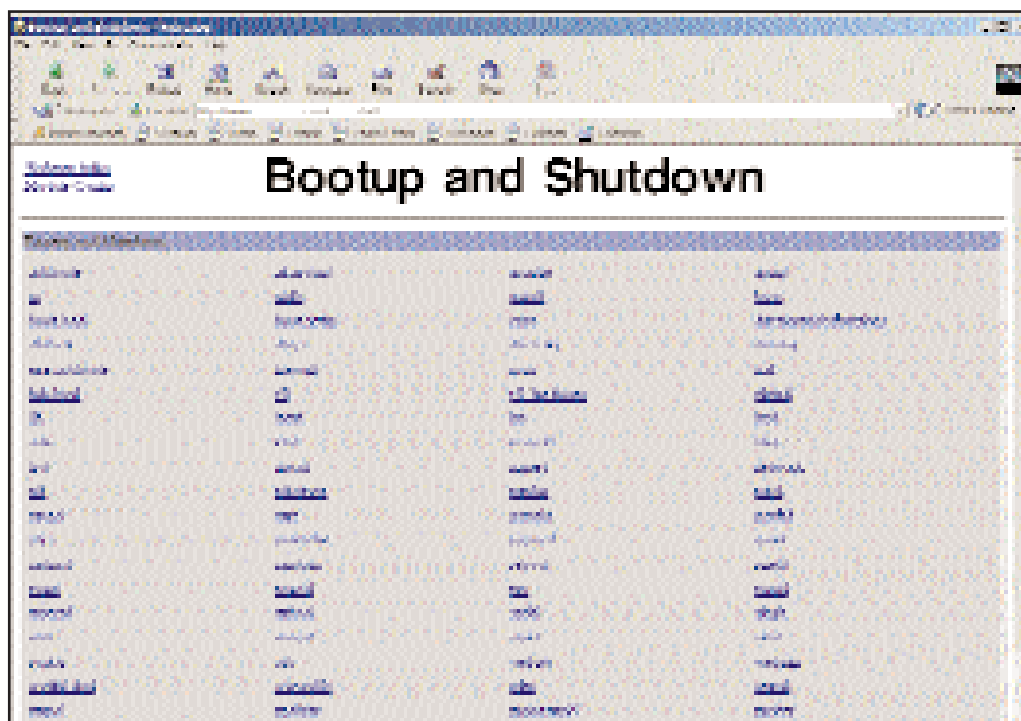
Incidentally, running 'apachectl start' is the best way to start Apache, as it performs checks on the configuration automatically. You may be able to get away with symlinking the `apachectl` file into the `init.d` directory, although it won't display the start/stop status information properly without a little hacking. **PCP**

Dave Coulson
dcoulson@pcpmag.co.uk

We can help!

→ Got a Linux problem? We can't answer questions privately but we're pleased to answer your questions through these pages.

→ E-mail your questions to: Linux Q&A at dcoulson@pcpmag.co.uk and we'll try to help. Alternatively, send them to Linux Q&A, PC Plus, 30 Monmouth Street, Bath BA2 3BW.



↑ Controlling your bootup and shutdown tasks isn't as easy as it may first seem, and as with so many things in the world of Linux, there's more than one way to skin a cat.

→ WordPro and Freelance Graphics

Sharing objects between these two apps is easy when you know how

↑ CREATE MENU
Selecting the object option from this menu will allow you to embed objects from other applications and files

↑ CREATE FROM FILE
As used in this tutorial, you can create a shared object directly from a file, so long as WordPro recognises the file type

↑ EMBEDDED OBJECT
Here, we have embedded a Freelance Graphics presentation slide into a WordPro document

↑ OBJECT TYPES
WordPro allows you to embed objects from Microsoft Office as well as Smartsuite's own applications

← RESOURCES
As you can see on our resources chart, working with embedded objects can tax your system's RAM and processor time

← OBJECT PROPERTY
You can assign each of your embedded objects a name, for later reference if you decide to use object scripting

← EDITING OBJECTS
If you double click on an embedded object, the parent application will open so that you can edit it - as you make changes in one program, they will appear in the other!

Lotus Smartsuite: PART THREE

Sharing data

Helen Bradley shows you how to get your SmartSuite applications to share data with each other.

Your SmartSuite applications were designed to work together so you can easily use data created in one application to enhance a document, slide or worksheet created in another application. This month, we look at some of the ways you can get your SmartSuite applications to share data with each other and some of the issues involved in making the right choices about how the data is shared.

Linking vs Embedding

There are two ways of placing an object from a server application (such as a Lotus 1-2-3 chart) inside a document in a client application (such as a WordPro document). You can Link (often called Paste Link) the object or you can Embed (Paste) it. The effect of each of these is different in terms of the relationship between the data in the client file and the original server file.

When you create a Link, the data in the client application is

permanently linked to the source file. Changes to this file will be reflected in the client file. When you Embed, you take a 'snapshot' of the data in the source file at a moment in time and paste that into the client file. Changes to the original data have no effect on the copy which appears in the client file. There are other implications of choosing either to Link or Embed in terms of file size and portability of the client file which you should be familiar with before you choose to embed or link data. The breakout box canvasses some of the differences between the two and when to use them.

Quick and easy embedding

Using drag and drop with your SmartSuite applications makes it easy to embed data from one application into another. For example, if you have both applications open at the same time you can drag a portion of a Lotus

1-2-3 worksheet, or a chart, into a WordPro document.

The result of this drag and drop process when you embed part of a worksheet is that you have the entire Lotus 1-2-3 file embedded in your WordPro file although only the selected portion is visible. If you select the object in the WordPro document and choose Workbook, Edit you'll open Lotus 1-2-3 as a client application inside WordPro so you can alter the worksheet's contents. The menus and toolbars in WordPro will change to display Lotus' 1-2-3 menus and toolbars and, almost all the options you have available in a regular Lotus editing session will be available. When you have finished editing the Lotus data, you can return to WordPro by simply clicking outside the Lotus 1-2-3 object on the screen.

Quick and easy linking

A quick way to link data from one SmartSuite application inside another is to use the copy

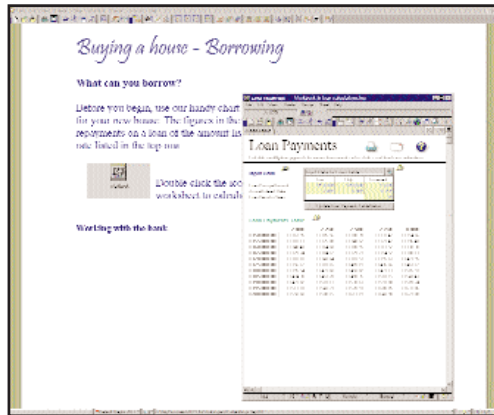
→ Linking vs Embedding

Moving files can be done through using either linking or embedding. But which one is better?

The client file will be quite small as only the link to the object is contained in it – not the object itself. The client file may become quite large because the object itself is stored inside it. When a linked object moves, the link will be broken and must be repaired by relinking.

However, do not link to another object if there is a chance that the files will be moved, transferred to another computer, renamed or deleted.

The linked object is embedded in the client file so the client file is totally portable – wherever the client file goes, the object goes too. Renaming, moving or deleting the file containing the original object which was embedded or pasted will have no effect on the client



◀ **Linking using icons is handy when your file is to be read online as it allows your user to double click the icon to open the file in the meantime leaving the screen uncluttered.**

file. If the original object is altered when the data in the file containing the linked object is updated, the client file will be updated (manually or automatically) to reflect the change.

Changes to the data in the file containing the original object has no effect on the copy in the client file. When you alter the object inside the client file you'll open the server application and the original file so your changes will be reflected in the original

file. You can update the client file copy but the changes will be limited to the copy in the client file. The original file will remain unaffected. It's useful when you want changes in the original document to be reflected in the client file and when the files are unlikely to be moved, copied or renamed. Use when you want the client file to be portable and when it's not necessary for changes in the original object to be reflected in the client file.

Quick Tips

JARGON BUSTER

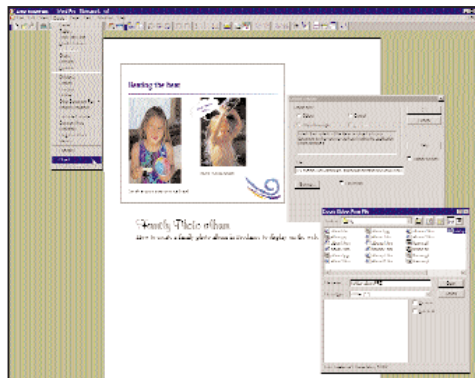
→ **Source or Server application** is the application in which you originally created the object which you are linking or embedding.

→ **Target, Client or Destination application** is the application inside which the object will appear.

→ **The Object** is the data which you create in your server application and which you make appear (by linking or embedding) in the client application.

→ **Linking** involves creating a pointer in the client file which points to a file on your disc and details of the application which created it.

→ **Embedding** involves copying data from one application to another, together with details about the application which created it so it can be edited.



◀ **You can easily embed a Freelance slide inside a WordPro document and use it to illustrate a report.**

list choose how you want the item to appear – the best choice is as an application object so choose Lotus 1-2-3 97 Workbook Object. Click Ok to create the link and you'll see the worksheet appear in the WordPro document.

You can change the data in the linked object at anytime simply by double clicking it. Because what is stored in the client document is a reference to the linked file, you will need to wait while the server application, in this case Lotus 1-2-3 opens, and the file is loaded. You can then make changes to it and these will be reflected as you make them in your client file provided it is set to update automatically. Be sure to save the file in the server application before closing it.

Embedding when linking isn't an option

When you use the Paste Special option in a client application, linking isn't always an option. Choosing Paste will allow you to embed the copied data in the client file.

You can use this to embed a WordPro table in a Freelance slide for example, where linking isn't an option. Make sure you highlight the entire table which you want to copy in Word Pro before you begin. Now choose Edit, Copy and switch to your Freelance presentation and choose Edit, Paste Special, Paste, choose Table (Formatted), click Ok.

Adding object icons

Another way to incorporate data from one application to another is to link it using an icon. For example, if you're creating a Word Pro document which will be read on the screen, you can include a Lotus 1-2-3 worksheet in the document as an icon. Your reader will see the icon and can click on it to view the object. The benefit is that, while they can see the icon in the document, the screen doesn't become cluttered with additional data. This option isn't available for all objects but it is for many.

To add objects as icons, first select the data in the source

application – for example part of a Lotus 1-2-3 worksheet and choose Edit, Copy. In your target application, WordPro choose Edit, Paste Special, make your choice of Paste or Paste Link and the type of object to paste it as and then, before choosing Ok, enable the 'Display as icon' checkbox. An icon will appear in the dialog, you can click the Change Icon button to choose another icon to use from the sample or Browse your disk to find one. When you're done, click Ok and you'll see the icon appear in your document.

When your reader reads the document and wants to view the worksheet, they simply click the icon and Lotus 1-2-3 will load and the worksheet will appear. You will, of course need to have the server application (Lotus 1-2-3) on the computer to view the data.

Adding a Freelance slide to a Word Pro document

Whenever you have a good Freelance slide you'd like to use inside a WordPro document as an illustration, you can embed the slide inside your Word Pro document.

To do this, open the WordPro document and choose Create, Object and click the Create an object from file option button, click Browse to locate the file on disk and click OK. The Freelance presentation will appear in the WordPro document. Double click it to open Freelance inside Word Pro and from the Slide Sorter view, double click the slide to view in the Word Pro file and choose File, Exit & Return to return to your WordPro document where the chosen Freelance slide will now appear.

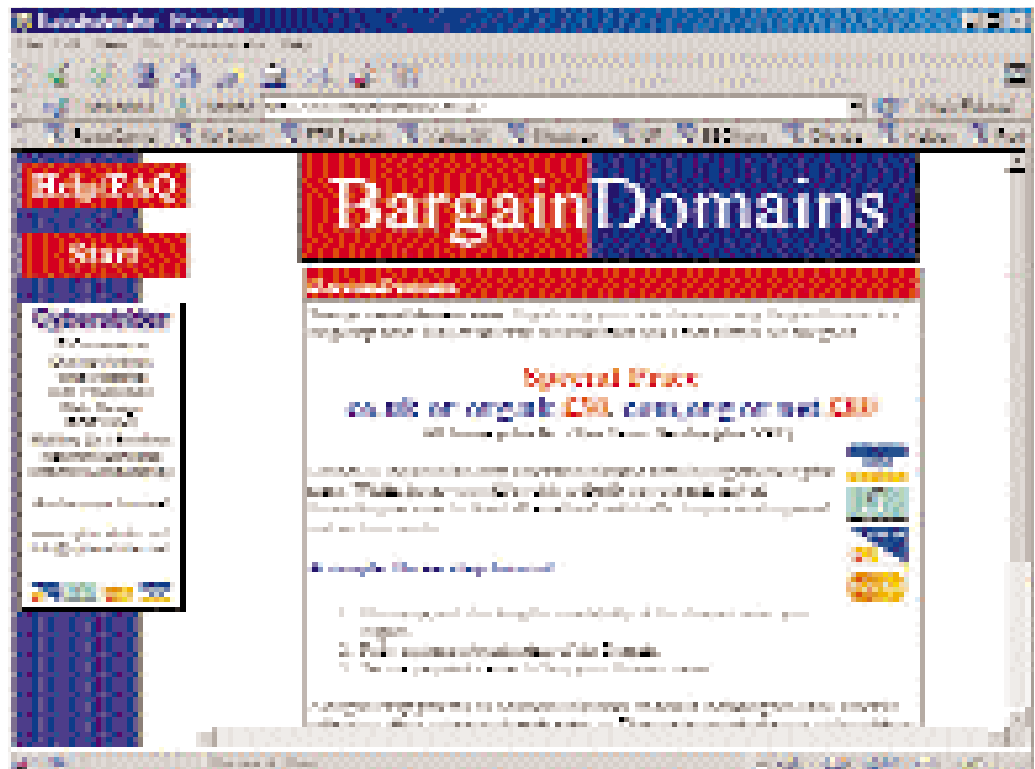
A practical example: Consider the situation where you've created a report in WordPro and you've added a Lotus 1-2-3 chart to it. The object is the Lotus 1-2-3 chart, and the source or server application is Lotus 1-2-3. The Client application is WordPro – where the object appears. Regardless of whether you link or embed the chart, WordPro knows that it was originally created in Lotus 1-2-3 although the effect of making changes to the chart are different depending on whether you have embedded or linked the chart. **PCP**



Helen Bradley
hbradley@pcpmag.co.uk

PCPlus
NEXT MONTH
The first part in a series of three new Streaming Media tutorials

→ Registering your own domain name enables you to move your Web site between providers without changing your URL.



Which server is right for your Web site?

Choosing the right host

You've designed yourself a Web site, now you need to decide how and where to publish your creation

Internet Web sites, as you've probably noticed, are all the rage at the moment: from huge multi-national corporations to the kid next door, it seems almost everyone has or wants one. So you've designed your Web site, the JavaScript works fine, and you've discovered that the 'blink' tag is a bad idea – but how do you get your Web site published on the Internet?

It can all get very confusing – phrases and acronyms such as SLA, cgi-bin, PHP, SSL, IIS, telnet, httpd and httpsswd are thrown around, but what you actually need is usually very simple. In this Masterclass we're going to take a look at options for hosting.

Each method has its own strengths and weaknesses, and suitability for particular applications. In any case, you should always take an hour or so out to take a close look at the company you're potentially going to be hosting with – their technical capabilities, who their current customers are and so

on. Remember, if the Web site goes down, it's you who's going to look bad to your visitors – not your ISP! Reliability is key.

Regardless of how you choose to go ahead, you should remember that the phrase '24-hour support' can be a misnomer: calling a support helpdesk at 3am will rarely get you on the phone to a member of the technical team, especially if support is outsourced. If you're paying good money for the service, you should always try to have a named contact within the company who is responsible for your account, and in many cases pager-based support can be better than telephone offerings!

Shared Web hosting

The most common (and certainly cheapest) form of hosting you'll come across on the Internet is offered through shared servers. Your Web site sits in a directory on a single machine which may host hundreds, perhaps thousands of other sites. This sort of solution is

great for low-use Web sites which don't require any special facilities – just some Web space and maybe a few basic features.

The most popular free Web hosting service is known as GeoCities. Online since the early days of the commercial Internet, it's now owned by Yahoo! and provides free Web space to anyone and everyone. It's a great solution if you're looking for a personal homepage, but its major drawback is that you're likely to end up with a URL looking something like www.geocities.com/athens/2644 – not exactly memorable!

Most dialup accounts with providers such as Freeserve, Demon and Mailbox come with free Web space, but the rub is in the name of the Web site – it will usually take the form of www.yoursite.isp.co.uk or www.isp.co.uk/yoursite and you'll end up with the name of the provider in the URL. Additionally you won't be able to take the URL elsewhere so when you leave your ISP to go somewhere else, the URL

itself disappears into the ether.

Of course, this is where domain names come in (typical domain names include joel.co.uk, future.net.co.uk, yahoo.com). Registering yourself a decent domain name can be quite tricky nowadays as many of the 'good' domain names are taken, but once you have your branding there you've effectively got a name for life which you can take elsewhere. The cardinal rule is 'short is sweet' – a domain name such as joesbrasseriechelsea.com is a lot less memorable than joes.com!

A word of warning – when registering a name, the cheapest isn't necessarily the best. Companies which offer you a 'free' domain name have clauses in their terms and conditions which expressly prohibit the re-siting of the domain name to a different provider; some even attach financial penalties to such action. Decent companies which register domain names on the cheap are numerous, but do remember to read the small print first!

Domain names also neatly circumvent the possibility of being tarred with the ISP brush, side-stepping comments such as "Oh, you're with such-and-such an ISP are you? Ugh!"

What to look for

So what should you look for in a basic hosting package? Top of your list should be reliability, quality of service, and a firm documentation of policy for when things go wrong. Clear documentation and guidelines posted on the Web site are a good indication, as are a firm pricing model – even if it just says "you get this much for free".

"But I've found this provider who will give me unlimited space for £10 a month!" I hear you cry. Well, while the size of the Web site is seen by many to be a deciding factor, you'll more than likely find that your own site rarely exceeds 5Mb in size, unless, of course, you're distributing some large files.

Keep an eye on usage: while many places state 'unlimited disk space', you'll find that impositions are made on site bandwidth or page hits: this has been the downfall of many a popular site. Decent hosting companies will offer some form of statistics (even if it's just the raw logfiles) so you can decide when to expand your service. Again, examine the conditions of use carefully – there may be financial penalties for high usage, especially if you go for 'bargain basement' hosting.

Most paid-for Web packages now offer facilities for scripting –

you rarely find this functionality in the 'free' offerings mentioned above. Scripting facilities are commonly known as CGI (or Common Gateway Interface), and are the means by which Web sites communicate with servers to give dynamic data; pressing Submit on a form, for example, is a CGI action.

If you're into Unix, you may well be looking for Perl facilities; or if you use Windows, you're more likely to be after NT hosting with Active Server Pages functionality. Either way, make sure you know what you want to be scripting in before you spend any of your cash. Believe me when I say it'll save a lot of headaches later!

Quite a few companies also now offer Control Panel interfaces: these are private passworded areas which offer extra features such as statistical analysis and passwording tools. Most of the time these interfaces will cost you a little bit extra, but if you feel like a babe in the woods they can be very useful as they make some of the more obscure functionality almost transparent to the user. Some providers even supply a basic home-page builder!

Most companies expect you to use the FTP protocol to upload your Web site, although you will rarely find a Telnet interface is provided to manipulate files live on the server. For performance statistics, the Zeus Web performance statistics page at <http://webperf.net> provides a basic run-down of the reliability of ISPs who subscribe to its service, but it is by no means an exhaustive list.

On the subject of value added facilities, you will find that quite a few companies will provide you with pre-cooked scripts, complete with instructions, which you can incorporate into your site. Typical offerings are likely to include such features as guestbook screens, hit-counters, form-to-e-mail interfaces and shopping-cart systems.

You should expect to pay around £150 a year for a decent hosting package which includes some sort of scripting facility, a control panel, and FTP-based uploading facilities.

Dedicated server hosting

More intensively hit sites requiring a level of dedicated service will demand a dedicated server. Instead of sharing the load with others, you get the entire machine for your site and its scripts. (Many banks, for example, recommend that you use a dedicated server for any e-commerce activities.) So if you haven't got the expertise to run your own server but require

→ Co-location

This is the option to investigate if you fancy owning and/or maintaining your own server hardware



↑ Co-location can be a good option, but be aware that when something goes wrong you'll probably be the one fixing it.

What do you do if you don't want to use someone else's server hardware, but prefer to build and maintain your own? Server co-location services and facilities management are enjoying a renaissance thanks to the e-commerce revolution, and there are plenty of locations around the UK which will be only too happy to plug your server into their network – for a price.

From a security point of view this can be the most attractive option, as you run everything except the network. Smaller providers may simply provide a power socket and a piece of network cable, larger management centres tend to provide high-profile security systems, environmental management, power backup, monitoring and 24-hour security.

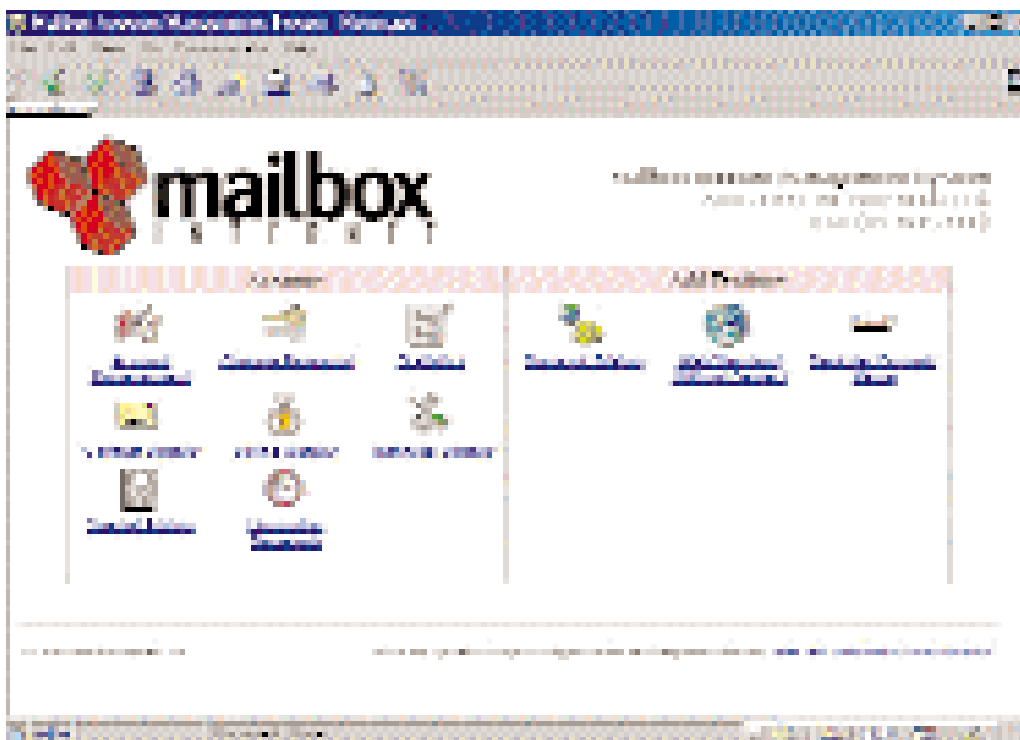
The main strength of co-location lies in its flexibility – you can decide what to upgrade and when without having to examine a contract or wait for your ISP to do it for you. The drawback is that you'll need to have a good understanding of the general principles of server operation, and if anything goes wrong, you'll have to sort it out!

Try to visit the co-location centre before you buy, so that you can find out what the environment is like – take particular note of humidity, temperature and cleanliness. Larger hosting centres require you to purchase space by the rack or half-rack, and mandate that all equipment should be 19-inch rackmounted units. If you approach the smaller budget centres such as Mailbox, you'll find that there are less restrictions on the equipment dimensions.

Check the network: a few traced routes to other servers on the network is prudent, and don't be afraid to ask questions about latency, downtime, and the all-important service level agreement. The issue of 'contention' (where more than one person shares the same Internet link) is becoming more and more important as companies try to cram as much usage as possible into one Internet link. You should try to get a contention of less than 3:1.

Hosting centre networks should always be switched or routed so that other servers are unable to sniff traffic to your particular machine – there are numerous horror stories floating around regarding passwords being logged and servers' security being compromised as a result!

Co-location can cost anywhere from under fifty up to hundreds of thousands of pounds per month, depending on what you want and where you want it. For instance, expect to pay £2,000 a month for a facilities-managed co-location rack with a 2Mb connection to the Internet. You'll find that the majority of centres are sited in London, although there are rumours that several ISPs are planning hosting centres in other parts of the UK.



↑ Control panel interfaces are a useful feature of some Web hosting company packages. They enable you to deal more easily with some of the more esoteric aspects of publishing a Web site and are worth looking out for.

dedicated and secure specialist facilities, then dedicated server hosting is for you.

A substantial number of the larger Web sites use managed servers so you will probably be looking at hosting on one of the Cobalt's RaQ, Compaq or Dell offerings so common to the larger business providers.

As with shared hosting, the target operating system is crucial to your choice of platform, and it's always worth consulting with a few providers to find out what hardware they can provide, and more importantly, what you'll need.

From a client point of view there's very little that's different to the shared-server approach, but you'll need to ask quite a few questions of your provider:

- What is the support response time if the server goes down?
- What service-level agreements are in place?
- Who gets administrative privileges on the server itself?
- Will the ISP change backup tapes, reset the machine for you, etc. and what are the costs of such actions?

If you are offered a customer reference by the provider, it's always worth taking it up as you will be relying on the provider to fix many of your issues, and customer service recommendations can speak volumes.

Try to avoid agreements which shift the onus for equipment

maintenance onto the site owner, or charge a premium for support – it can be quite difficult arranging to have a hard disk replaced if you're in Aberdeen and your server's in London Telehouse! You should also make sure that there is no penalty (either financial or from the support perspective) if you install your own programs on the server.

Server software

It's worth taking a brief parenthesis here to evaluate server software for Web hosts, although as always it is dependent on your own preference for operating system.

You should always assume that you'll rarely have access to the server itself (well, at least in the case of managed servers and co-location), so you should always provide for some form of remote-access solution. While Unix-based systems lend themselves well to such a feature, you can also use remote administration tools under Windows NT or packages such as PC Anywhere.

By far the most popular Web server software on the Internet is Apache (www.apache.org). A free package which is highly flexible and copes well with high rates of utilisation, it's available for most flavours of Unix (including BSD and Linux), as well as Windows NT. And to keep the statisticians among you happy, it produces standardised logs which can be analysed by widely available programs such as Webalysers, Big Brother Webstats and Webtrends.

Permanent connectivity

The most expensive and inflexible option is that of permanent connectivity, although if you already happen to be the proud owner of a permanent link then you can simply connect your own server onto the network. Bear in mind, however, that you will need to provide your own environmental control, backup power supply and the like.

Permanent, dedicated connectivity is expensive, and it can be time-consuming and costly to upgrade: you will typically be looking at a 21-day lead time on any expansion and in all likelihood you will need to pay a reinstallation fee. Costs are also geographically-biased – a 2Mb dedicated link within central London will set you back at least £12,000, but the same connectivity outside the M25 will be vastly more expensive!

If you plan on installing permanent connectivity, you should always make sure that the telecommunications cost is included in the ISP's own charge: some providers won't mention this, and by the time the bill arrives from BT, it's too late because you're already contracted. Likewise, ensure that the procedure for reporting faults is documented as it can be very frustrating phoning the provider, which tells you to phone BT, which puts you on hold for 20 minutes before telling you to phone the provider, and so on.

You will need a router to connect the link between the ISP and your local network. Some

providers will build this in as a leased cost, although you should check whether it affects the price. If you do need to purchase your own, you should take a look at the Cisco 1600 series routers, and I've recently been quite impressed by the performance of the Allied Telesyn routing kit for my own line.

As for your server environment, you can get away with purchasing a small UPS – the APC ones are good on an individual basis for servers as they provide a serial port on the back which will signal a power failure to your server, closing the unit down gracefully at the appropriate time without any file loss. In most cases, small UPS units also provide smoothing facilities which can handle the occasional power glitch.

A cool, clean and well ventilated room can be converted into a makeshift server room, but pay particular attention to the ventilation aspect. A previous employer of mine thought it would be a great idea to put eight servers in a small boxroom with no vents, and then wondered why they all overheated in the summer. Also try to keep the room as clean as possible, otherwise CPU and PSU fans will become caked in dust resulting in some form of failure, or even permanent damage.

If you're supporting the servers yourself, entrust server passwords to someone else who can carry out basic administrative functions: it's an odds-on bet that the server will malfunction just as you're stepping off the plane in Marbella at the beginning of your first holiday in five years! Likewise, make sure that there's someone who can bash Reset when needed...

In a nutshell...

As with many things on the Internet, you normally get what you pay for. If you're just looking to host your own personal Web site, then bundled Web space is ideal. For a more flexible solution, try to go for cheap ISP co-location, if you can afford it.

See you on the Web! **PCP**



Joel Rowbottom
pcplus.editor@futurenet.co.uk

PCPlus

NEXT MONTH

Advanced Office
Helen Bradley shows
you how to set up a
Command Centre in
Microsoft Excel.

Publishing your Web site

Yahoo's GeoCities offers free Web hosting and some useful page building tools



1 GeoCities offers a free Web hosting service at www.geocities.com. It's owned by Yahoo and, if you've already signed up for a Yahoo e-mail account, you may well find that it recognises you, as our alias, MentalPR, has been in the example above. Click on Start Building Now to get going.



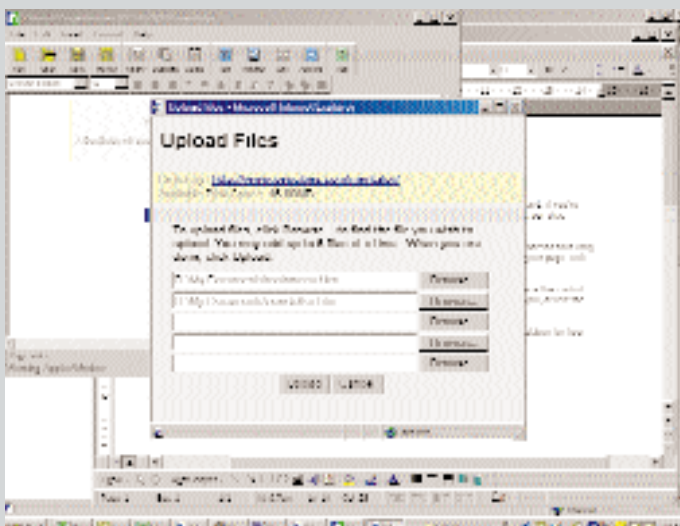
2 The first thing you'll need to do is sign in to your account, or create one if you don't already have one. This doesn't take long and once you're signed on, the system will ask you to define the topic that best describes your page, so that it can be found easily by search engines.



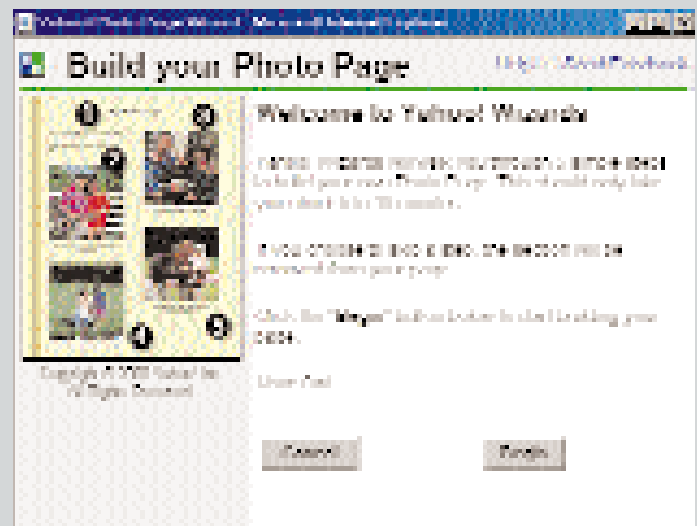
3 Click through the terms and conditions page to get to the main Web-page building section. This is the control centre for your Web page – you can use PageWizards, which try to create your page for you, or use the PageBuilder, which allows greater control over your site.



4 PageBuilder is a small, downloadable application that enables you to do basic Web-page manipulation for free. You can drag and drop text, images and links directly on to your Web page. It is limited but it does all the basics in a fairly friendly and intuitive fashion.



5 If you've already got Web pages on your PC, you may not need to use PageBuilder. Click on Upload & FTP from PageBuilder or the main screen to access your uploading console. Click on Browse to find files on your PC, then Upload File to transfer them to GeoCities.



6 If you're not feeling up to proper Web editing, you can create a page in minutes by choosing a PageWizard. Here, we've decided to build a Photo Page. Yahoo's software takes you through the steps one at a time – it's very simple, but a good introduction for beginners.



Microsoft wins right to appeal

→ **This one will run and run**

Another few years may have been added to the US Department of Justice's case against Microsoft. The case was due to go straight to the Supreme Court for a quick ruling, ready for Microsoft to be broken up using a fast-track procedure. But Microsoft argued that its appeal should be heard in the lower courts first. Microsoft won the day, after the Supreme Court voted 8-1 in favour of the appeal. Microsoft's shares rose following the news. The only judge to dissent claimed that it would have been better to have a quick legal certainty established by the Supreme Court.

The ruling means Microsoft will be free to argue its appeal. If it loses, the case could drag on for years - which is in the interest of no one. Microsoft's share price has taken a pounding over the last year and large corporate users might put off major procurement decisions until the company's fate is known. Fortunately for Microsoft, the world of technology moves much faster than the legal world. By the time any ultimate ruling is made, perhaps

in 2004, the PC market is likely to have changed out of all recognition. The last few years have seen dramatic changes, not least in the way the Internet is now at the forefront of developments.

One change that Microsoft obviously knows will be in place is its .NET online service. This gets users away from boxed operating systems and into a world where they rent the services they need. This means any ruling about splitting Microsoft into operating systems and applications companies would be laughable. This has led some commentators to say that US antitrust law is not effective when it comes to the computer industry. After all, Microsoft is still doing the things it was effectively found guilty of. The original argument over whether PC manufacturers should be forced to install Internet Explorer (IE) on their Windows 95 PCs was obviously overtaken by events. IE4 became a standard feature of Windows 98 and IE5 in Windows 2000 and Windows Me. Windows Me also forces users to install Media Player 7 and Movie Maker.



Shaun Open

"Microsoft is confident of its case. It's in the best interests of Microsoft, our customers and the entire industry to put this behind us. We plan on outlining a number of legal, factual and procedural errors committed in the district court which should result in this judgement being reversed."

Microsoft believes it will win the appeal it's now been granted. Speaking to **PC Plus**, Shaun Orpen - Director of the Corporate Marketing Group at Microsoft UK said, "Microsoft is confident of its case on appeal and looks forward to presenting its arguments to the court of appeals. It is in the best interests of Microsoft, our customers and the entire industry to put this issue behind us, so we look forward to making our case on appeal. We plan on outlining a significant number of legal, factual and procedural errors committed in the district court which we believe should result in this judgement being reversed."

If Microsoft loses and is eventually forced to split into two companies, various apocalyptic warnings have started to surface on what this will mean for users. A report from the Institute for Policy Innovation's Centre for Technology Freedom (www.ipi.org), based in Texas, suggests breaking up Microsoft will cost every US citizen \$507 and that US GDP would be hit by \$1472 billion. And this is on top of a loss of \$596 billion in personal income as well as 44,900 jobs.

Going one better is the Association for Competitive Technology, which says that consumers across the world will end up paying up to \$310 billion for the break up of Microsoft. But it should be noted that this group receives funding from Microsoft. The full report from ACT can be found at www.actionline.org/pubs/remedies3.pdf.

It's clear that Microsoft is delighted to be able to argue its appeal. Judging by its earlier appearances in court, there will no doubt be plenty of interesting events. Who could forget its claim that IE4 could not be removed from Windows 98? This quickly led to the production of Windows 98 Lite, courtesy of a Windows user. And this has evolved into a 'Microsoft Lite' business at www.98lite.net.

What is Microsoft accused of?

The allegations made

The DOJ, and later 19 US states, accused Microsoft of violating antitrust law:

- By erecting barriers to competitors.
- Entering exclusionary agreements.
- Tying the purchase of Windows to the acceptance of other software.
- Campaigning to keep Netscape Navigator away from users.

Prior to this, the courts had already been convinced that Microsoft was acting illegally with its browser. Some competitors now find themselves in an awkward situation, following earlier agreements with Microsoft. For example, AOL owns Netscape, but it's still forced to use IE as part of its online services.

SOFTWARE NEWS

MICROSOFT BACKS DOWN

Following our lead story in issue 169, Microsoft has backed down over its insistence that new licenses are required when OEM copies of Windows are replaced during corporate rollouts. In a statement released on its Web site, Microsoft now says that customers on its Select and Enterprise programmes can reinstall copies of Windows without requiring a further license. This is a victory for users and for common sense. The problem was originally highlighted by analysts at the Gartner Group.

VIRUS-LIKE TENDANCIES IN MSN EXPLORER

A reorganisation of MSN will see Microsoft launching MSN Explorer - software and an online service combined. Providing a package of Internet Explorer, Outlook Express, Media Player, search, calendar and messaging facilities, MSN Explorer is being targeted at new users. It will be easy to use because of a single logon and one-click access to all the major facilities. But alarm spread when the MSN Explorer's second preview appeared to have taken a leaf out of Melissa's book. The software is able to advise on a change of e-mail address by writing to everyone in the local address book - complete with a promotional message about MSN Explorer. Some users have also reported a tendency for the software to insist on Hotmail accounts being opened in place of MSN POP3.

NETBUS LEAVES STOP

NetBus Pro (www.netbus.org), the controversial remote administration and monitoring tool, is back on the menu with Symantec. Norton Anti-virus no longer scans for the utility, after a campaign by its Swedish creator. Although the tool was designed for PC administrators, it soon became a tool used by hackers, allowing a PC to be taken over after receiving an infected e-mail.

EXPLOIT THE WIZARD

Exploit, probably best known for its Submission Wizard tool, has now launched Position Wizard. This is designed to check a Web site's position in all major search engines. A standard Position Wizard key means there will be no limit on the number of sites, terms or URLs that can be checked. Exploit believes Position Wizard compares with similar tools costing 10 times as much. More information can be found at www.positionwizard.com.

Microsoft launches .NET



← Microsoft .NET - just a bit of XML?

→ Some products already running late

Microsoft's all encompassing .NET online service is starting to take shape, although a full service will not be available until 2002. At its launch in London, Microsoft said .NET is 'the biggest launch in our history'. Several advance products are already shipping in whole or in release candidate form, including Windows 2000 Data Centre, SQL Server 2000, Exchange 2000, Internet Security and Acceleration Server 2000 and Host Integration Server 2000 (the replacement for SNA Server).

Commerce Server 2000 and Application Centre 2000 are expected to ship by the end of the year.

But BizTalk Server 2000, originally scheduled for a 1999 launch, has

been delayed again and will not appear until 2001. Mobile Information Server 2001 is also expected in the first half of next year. This is aimed at organisations that require mobile users to be able to access data guarded by firewalls. Windows.NET is also likely to ship next year. But Windows.NET Server is not expected until 2002 - along with Office.NET.

Microsoft portrays .NET as a revolutionary service, providing unprecedented functionality and sophistication. The company appears to be betting its future on .NET but users are going to take a lot of persuading to bet their own businesses on it. Many users will view .NET as just a service made up of existing applications with some added XML spice.

Pentium 4 delayed

→ Intel needs this launch to be a success

Even though Intel has never given an official launch date for the Pentium 4, it was widely expected to debut on 30 October. But this has been put back due to problems with the i850 Tehama chipset. Intel is also thought to have experienced production problems. Although 250 Pentium III chips could be built from a single wafer, this reduces to just 100 for the Pentium 4. Additionally, yields are believed to be lower than the Pentium III - 70 per cent, compared to 80 per cent.

Some PC manufacturers have been informed that the new chip will ship in the third week of November, others believe it will be later. Intel desperately needs the



↑ 1.4-1.5GHz on a screen near you - soon

Pentium 4 to be a success following the recall of the 1.13GHz Pentium III, its general failure to produce chips in sufficient quantity and the increasing competition from rivals such as AMD. The Pentium 4 is expected to launch in 1.4GHz and 1.5GHz versions,

moving into 2GHz territory next year.

As well as higher clock speeds, other improvements will be seen in the form of a 400MHz system bus and dual-channel Rambus Direct Ram (RDRAM). Prices appear to be lower than expected for a new processor. The 1.4GHz chip looks set to be priced at \$652, with the 1.5GHz model going for \$827. Meanwhile, Intel has also been working on expanding its mobile range of processors. This includes a new 700MHz Celeron and 800 and 850MHz Pentium IIIs. All three of these chips utilise Intel's SpeedStep technology and a battery life of up to six hours is being claimed.

New AMD low-power processors

→ Higher speeds and lower voltages



Realising the increased need for low-power and embedded processors, AMD has launched two new ranges of embedded chips that are available in standard and low-power configurations. The AMD-K6-2E+ and AMD-K6-III+ embedded processors are based on AMD's 0.18 micron technology, and are designed for set top boxes, thin client terminals and telephone, and point-of-sale equipment. Both families of processors bring higher clock speeds

and improved performance to the AMD-K6 family, whilst requiring lower operating voltages than previously.

The K6-2E+ runs at 400, 450 and 500MHz in standard power and 350, 400 and 450MHz for the low power version. The standard power K6-III+ is available in speeds of 400, 450, 500 and 550MHz and the low-power as 400, 450 and 500MHz. All of the new processors are available in 321-pin grid array (PGA) packaging. Some will also be available in the company's new 349-Lead Organic Ball Grid Array (OBGA)

← AMD - keeping the heat on Intel packaging. The low power versions include the equivalent of Intel's SpeedStep, AMD's PowerNow. This allows for reduced power consumption for power-sensitive applications.

AMD is also hard at work in the traditional processor market. Although the 1.2GHz Athlon was not due until the end of the year, the chip was brought forward and was expected to be available at the start of November. And at the lower end of the market, an 800MHz Duron was slated for a launch around the same time.

Lotus looks to new markets

→ But translation software gets the thumbs down

Years of tough competition from Microsoft have relegated Lotus to a backwater of the PC software market. Now under IBM ownership, the company is looking at new areas in which to compete. At the recent Lotusphere 2000 conference in Berlin, Lotus announced its move into the wireless arena with K-Station - a browser-based portal allowing users to acquire, share, and transfer knowledge. The K-Station can collect and store parts of the information-gathering process so the user can see



↑ Lotus is not quite there when it comes to talking 14 languages

how decisions are made. The announcement revolved around Sametime 2.0 - the real-time communications suite that offers audio and visual facilities over a business network.

Lotus' Translation Services for Sametime was put forward as a main product for the future. It has been billed as offering chat and instant messaging facilities, with translation between 14 languages. But the product was heavily criticised, both for the time Lotus has taken to develop it - and the limited functionality on offer. The feeling seemed to be that although Translation Services for Sametime might be acceptable for general chat, business conversations would require a whole new level of sophistication.

HARDWARE NEWS

BLUETOOTH FROM HP AND 3COM

Hewlett Packard and 3Com have got together to create Bluetooth hardware for desktop and portable PCs. The first product from this alliance is expected to be a Bluetooth PC card, which is expected to ship in early November. The card is aimed at business users who need to maintain connectivity within a local area such as an office. Costing approximately £100, the card appears to be well priced - especially as wireless products tend to attract premium prices. The Bluetooth PC Card is the first of several announcements which can be expected from this alliance.

OFTEL CRITICISED

OFTEL has been lambasted by telecom suppliers and the European Commission (EC) over its handling of the unbundling of the local loop. The regulator kept to a July 2001 date previously agreed with BT, despite the EC wanting full access before the end of this year. OFTEL is supposed to have unbundling underway by that point - but progress so far indicates that only a few hundred exchanges will be ready by the expected date. Unbundling is essential for the country's future use of the Internet. BT's monopoly on the last mile of the telephone network has meant little choice for users.

DELL AND TOSHIBA LINK UP

Dell has recently become the largest seller of notebooks in the UK - overtaking deadly rival Toshiba. But in a surprise move, Toshiba has signed a \$5 billion deal with Dell to supply it with notebook memory, storage and LCD displays. Running for three years, there is an option for Dell to renew for extra years. It's also thought that the deal could be enhanced to include other items of hardware.

NOT VERY FUNNY

New viruses employing Visual Basic Script are continuing to appear, proving you can't trust any unexpected e-mail attachments which may be received. The latest virus, which goes by the name of VBS/Funnystory - sends itself to everyone in the local address book. It then looks around for any handy items of data, such as passwords. Although the virus has been rated as low-risk, there is still a danger of users letting their guard down - especially as there have been no viruses in the headlines in recent months.



↑ The next 25 years could be based on the Itanium - according to Intel

ITANIUM PRODUCTS ON SHOW

The 64-bit Intel Itanium processor is slowly edging towards the launch pad. Based on Intel's explicitly parallel instruction computing architecture, the new processor has been under development for seven years and was previously known as Merced. Aimed at the high end of the market, Intel believes the Itanium will give it a platform to work from for the next 25 years.

More than 200 hardware and software engineers from Intel's partners met recently to look at new products based on the Itanium. Companies represented at the tests include Microsoft, 3Com, IBM, Red Hat, Dell and Hewlett-Packard. Test systems running the new processor are expected to be shipped to selected users by the end of the year.

3G WORRIES SET IN

→ Europe criticised for auction process

According to the Massachusetts Institute of Technology's Media Labs, Europe got it badly wrong with the auction of 3G (third generation) mobile phone licenses. It claims the auctions were not carried out in a genuinely free market - largely because national companies such as BT would not have been able to survive without a 3G license. With £100 billion paid out for licenses in Europe, the telecom operators are now seriously handicapped. And the Institute warns that many users will be content to stick with new pre-3G services such as GPRS (General Packet Radio Service). Although much slower, it believes such services are all many users will require.



↑ 3G - another stealth tax?

COREL BEGINS ITS RECOVERY

→ **As Microsoft purchases a quarter of the company**

Corel has had a very turbulent few months - with its failure to merge with Inprise, financial difficulties and the resignation of its chairman and founder Michael Cowpland. Corel then announced that it was downsizing the company's Dublin office, with the loss of 140 jobs. This was part of a planned \$40 million package of cuts. The new chief executive, Derek Burney, announced the decision on the Web site. He said, "While the decision to consolidate our engineering operations to Canada was not easy, it's a necessary step to streamline our costs and development efforts. By doing so, we believe we'll be in a better position to deliver the products and services you've come to expect."

The news started to get better - with the company's latest results showing losses decreasing and sales stabilising. Sales were \$36.4 million compared to \$36.6 million in the previous quarter. And losses were \$10.7 million compared to \$23.6 million. In a surprise move, Corel announced that Microsoft has purchased 25 per cent of the company (valued at \$135 million). Although the two have been deadly rivals in the PC software arena, it looks as though Corel will become a key Microsoft partner for its new .NET service.



↑ Derek J. Burney - Corel's new President and Chief Executive

TALK 21 E-MAIL EXPOSED

BT's Talk 21 e-mail is the latest online service to suffer security difficulties. John Heaton, owner of the Hotelkeeper.net service, was amazed when the log files on his Web server allowed access to Talk 21 accounts. This worked for each user he tried. Reporting the matter to BT, Mr Heaton was given a special e-mail address. He did not receive a response, so contacted BT again. With the fault still apparent, he felt there was no alternative but to tell the media. The story broke on BBC News Online and following this, BT worked to close the loophole. It claimed the fault was only apparent for the 30 minutes after a user had logged off.

LINUX NEWS

AUTO UPDATES FOR RED HAT

Following an increasing number of attacks on Web servers, Red Hat is going to change its implementation of Linux to automatically update itself when security patches are released. Even though patches have been available for any security issues found with Red Hat Linux, the problem has been getting complacent users to install them. Automatic updates may make it harder for hackers to exploit loopholes, but some business users have expressed concern at software updates entering their networks in this way. Even so, a clear compromise will have to be found as hackers increasingly rely on their own automated tools.

LINUX OFFICIALLY A THREAT TO MICROSOFT

It seems that Linux has finally arrived - after Microsoft's Steve Ballmer revealed the open source operating system had joined the list of biggest threats to his company. Also on the list are IBM, Java developer Sun Microsystems, database supplier Oracle and online company AOL. Although he didn't name any particular Linux vendors, he said it was important now for Microsoft to have a strategy that reflects the reality of the Internet. And Microsoft .NET is its answer.

RED HAT FOR RED BOX NETWORK VENDOR

In a move that could spell a change of fortune for ailing 'red box' network vendor Novell, Red Hat is to use the Novell Directory Services (NDS) product as part of the Red Hat Network. Although Novell had a seven year lead over Microsoft on directory services, it failed to capitalise on its lead. Many analysts have felt that Novell made a mistake by not making NDS open source. For Linux administrators, NDS will provide a single log-on for distributed applications, as well as making user management easier.

LINUX GETS CDSA SUPPORT

Caldera Systems Inc (www.calderasystems.com) is working with Intel and Bull to bring Intel's Common Data Security Architecture (CDSA) to the Linux environment. CDSA is a security framework for producing secure applications that work together, across multiple environments. A 32-bit version will be included in the next edition of Caldera's OpenLinux, which is scheduled to ship by the end of the year. A 64-bit version is expected to be available for the forthcoming Itanium processor.

Unmetered ISPs clamp down on misuse

→ **Prices also start to rise**



Although some users are enjoying unmetered Internet access, many of their ISPs are effectively still paying metered rates to BT. But these ISPs are now clamping down on users they believe are taking advantage. It's hard to know where reasonable usage ends and unreasonable usage begins. But after announcing increased losses of £178 million, Freeserve said it was planning to contact all users who have been accessing its unmetered service for more than 16 hours a day - essentially every waking hour.

As with all other unmetered ISPs, Freeserve has a clause in its terms and conditions which allows it to take action against users with 'abnormal' usage patterns.

The Free Internet Group (FIG) is also taking action against users who are misusing its network. In particular, it's targeting business users - who will have their accounts terminated. Such users will also be billed for all their previous connectivity. And following its heavily-promoted £50 service, the FIG has raised the price to £8999. RedHotAnt users have also seen price rises, although only for new customers. The joining fee has risen to £40 and its peak/off peak package now costs £90, rather than the previous £40. Users have also been intrigued to see a 'usage checker' on the main RedHotAnt screen. Most of the subscribers who tried it assumed a random number generator was behind the result. On 4 October, one user was informed he had been online for 350 hours that month.



↑ Unmetered Internet - do you need to get a life?

EMI and Time Warner call off merger

→ **The two return to the drawing board**

The EMI and Time Warner merger has run into difficulties with the European Commission. Regulators are concerned that the new company could dominate the traditional and Internet music markets. But their application to merge has been withdrawn, in advance of it almost being thrown out. The two companies are still planning to merge and withdrawing

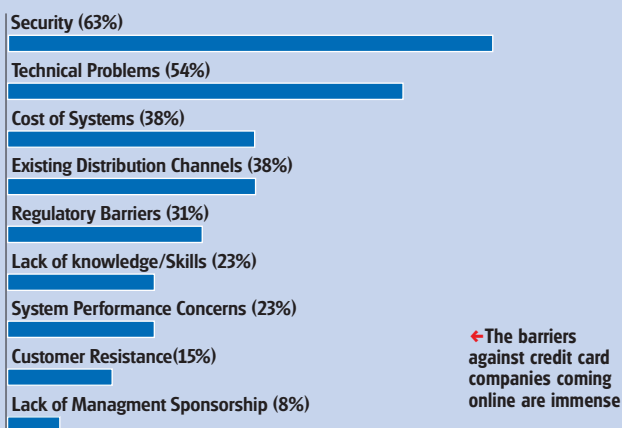


↑ EMI and Time Warner - they'll be back

the application means they can produce a new proposal away from the spotlight.

Their task is to find a solution that satisfies the regulators on both sides of the Atlantic. Other companies could move in - the German Bertelsmann Music Group is believed to be interested in EMI, and the European Commission are considering AOL's planned purchase of Time Warner. This \$135 billion tie up was expected to get the green light.

The Barriers to E-Commerce



Security tops list of online finance problems

→ Scratch card aimed at users without credit cards

Bylane Research has been commissioned by iE (Intelligent Environments) to conduct research into the Internet strategies of UK credit card issuers. The companies quizzed represented 196 million of the credit cards issued in the UK. Credit card companies are at the front line when it comes to potential problems on the Internet. It's no surprise that 63 per cent of respondents put security at the top of the list of barriers. Banks rely on software vendors to close loopholes. Technical problems were also high on the list - the Halifax has recently delayed its online service after experiencing software problems. Anyone wishing to purchase the full report 'Internet-based Credit Cards: Customers at Any Cost' should contact Sgrandidge@ie.com.

Scratch 'N' Surf at World Online

→ New scratch card aimed at users without credit cards

World Online has selected Jaldas as the payment method for its pre-paid card system. This enables World Online subscribers to purchase Internet access and online goods and services. A scratch card may sound like a form of gambling, rather than an addition to an online environment. World Online selected Jaldas on the basis that most new mobile phones are pre-pay and not everyone has a credit card. Available from retail outlets in £5, £10 and £20



↑ Scratch, but there's no chance of hitting the jackpot

denominations, the cards are scratched off to reveal a PIN that can be keyed into a Web site. The cards provide secure payments that are suitable for streamed services such as online

games and music. They can also be used for micropayments towards downloadable files and cheap physical wares. Prices can be controlled using several parameters, including elapsed time, the number of clicks per site and the number of files that are requested. Jaldas is a global payment system developed by EHPT, a company owned by both Ericsson and Hewlett Packard. Jaldas's Web site at www.jaldas.com offers more information.

INTERNET NEWS

VODAFONE WAP STING EASED BY WASP

Business Vodafone users are going to be offered WAP services from OverNet Data, a wireless ASP (WASP). The OND Phonebook allows a business to make its internal telephone list available to its employees over WAP handsets. Job Allocation allows work to be managed remotely and Stock Level provides stock management facilities whilst on the move. OverNet Data believes it's the first WASP to be offering services over a major network. WAP has so far failed to live up to the hype. A user backlash can only be avoided once a range of genuinely useful applications becomes available.

RIVALS CREATE UDDI STANDARD

Numerous rivals have got together to form an Internet standard called Universal Description Discovery and Integration (UDDI). Designed to provide open standards for e-commerce, the original Microsoft/IBM/Arriba initiative is now backed by three dozen technology companies. According to the standard's Web site at www.uddi.org, "UDDI is the building block that will enable businesses to quickly, easily and dynamically find and transact business with one another using their preferred applications."

NEW BLOW TO ONLINE BANKING

Confidence in online banking has been hit again, following revelations from a UK security expert. He claimed to have found an easy way to gain access to millions of accounts. This organisation runs hundreds of millions of Internet bank accounts, and also provides services to UK financial organisations such as the Abbey National. The case comes on the back of a series of high profile online blunders, many involving well known financial institutions.

ASPS SHOULD GO PRIVATE

Application Service Providers (ASPs) have been put forward as the future of business computing. Microsoft is heading this way with its .NET service. According to Hub, an application hosting company, only ASPs offering services over private lines will survive. Internet users compete with each other for the resources. They face an array of security threats - private lines do not. Hub believes customers will desert ASPs who work over the Net. Will this make Microsoft rethink its plans for .NET?

NOVEMBER - FEBRUARY 2001

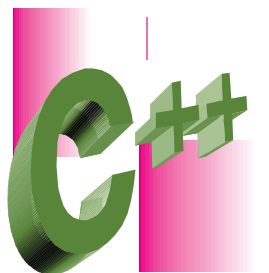
UPCOMING EVENTS

→ Get yourself to this month's computing and I.T. events

DATE	22-23 November
EVENT	Internet World Manchester 2000
VENUE	G-Mex, Manchester
CONTACT	www.internetworld.co.uk
DATE	28-29 November
EVENT	Application Integration Management Briefing
VENUE	Swallow International, London
CONTACT	www.butlergroup.com
DATE	3-6 December
EVENT	GI2000 (E-technology/business management conference)
VENUE	EICC, Edinburgh
CONTACT	www.global-informatics.com
DATE	5-6 December
EVENT	Interactive TV and Online Learning
VENUE	Café Royal, London
CONTACT	www.access-conf.com
DATE	14-15 December
EVENT	ASP: The Keystone to a Successful IT Strategy
VENUE	Crowne Plaza London St James
CONTACT	www.access-conf.com
DATE	10-11 January
EVENT	Comms for Business 2001
VENUE	NEC Birmingham
CONTACT	www.comms-dealer.com
DATE	31 January - 1 February
EVENT	Digital Rights Management and Digital Rights for Publishing
VENUE	Café Royal, London
CONTACT	www.iqpc.co.uk
DATE	6-8 February
EVENT	ISPCON Europe 2001
VENUE	Olympia 2, London
CONTACT	www.ispconeurope.com
DATE	6-8 February
EVENT	M-Commerce World
VENUE	Olympia 2, London
CONTACT	www.mcommerce.com
DATE	7-8 February
EVENT	Softworld HR and Payroll
VENUE	Hall 15-17, Excel, London
CONTACT	www.softworld.co.uk
DATE	13-14 February
EVENT	Technology for Marketing
VENUE	Olympia 2, London
CONTACT	www.t-f-m.co.uk
DATE	23-25 February
EVENT	SoHo Show London
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C++ Workshop



How to Debug your C++ Builder Applications

So you've written a great new C++ Builder program, but you can't get the thing to work properly.

Dave Jewell shows you how



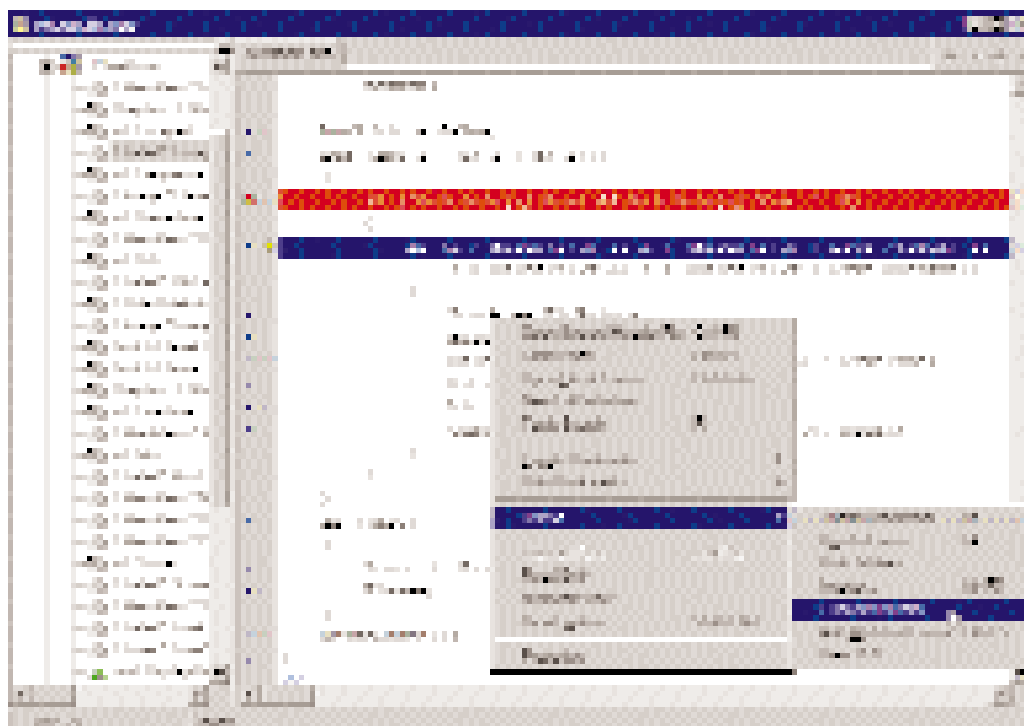
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Debugging is generally one of the least popular aspects of application development, but in this month's **MasterClass**, I'll show you a few handy techniques which exploit the built-in debugging capabilities in C++ Builder itself. As with those six-monthly trips to the dentist, I can't actually promise to make debugging fun(!), but at least you'll end up with a better idea of how to track down those little software gremlins for yourself.

Making the debugger work for you...

One of the biggest mistakes that novice programmers make is a failure to fully appreciate everything that the debugger can do for them. For example, let's suppose you're writing an interactive game, and you've arranged things so that when the score reaches 1,000, the user should get given another life. Unfortunately, this part of the code doesn't seem to work – the score of 1,000 comes and goes, but the number of lives remains resolutely the same.

At this point, the novice programmer might simply set a breakpoint on the part of the code which gets executed when the score reaches 1,000, the idea being that – when the breakpoint is triggered – the problem can be investigated. This approach will work fine, but you'll have to achieve a score of 1,000 before you can start investigating the bug! That might not be a problem if you like playing your own computer game, but you'll



↑ The context-sensitive Debug menu provides access to a number of different debugger options, one of which is the Evaluate/Modify dialog which can be used to examine and change the value of program variables during a debug session.

waste a lot of time if you use this approach every time. A better technique is to use the Evaluate/Modify dialog in the debugger to artificially boost your score to 1000

Unfortunately, under C++ Builder version 4.0, the Evaluate/Modify dialog is a little better hidden than it ought to be. To bring up the dialog, right-click in the code editor window while you're debugging your program and you'll see a pop-up context menu containing a

Debug menu item. This, in turn, leads to a set of debug options, one of which is Evaluate/Modify. Click this and the Evaluate/Modify dialog will appear.

Once here, you can type an expression into the Expression box and hit return. The value of the expression will be immediately displayed in the Result area. Thus, if your form class has a private member variable (an integer) called `Score`, you could simply type `'Score'` to see its current value. The

expression evaluator understands any valid C++ syntax, the obvious restriction being that any variables you refer to must be in scope at the current execution point. Thus, you might type `MyForm-Score` if you're not currently in a method of the form class, or `Score.H` if you wanted to see the result as a hexadecimal number. You must remember that the expression evaluator obeys all normal C++ rules of syntax including case sensitivity, so if you accidentally type score, it'll be

→ C++ Builder Debug Basics...

Debug your C++ builder using a 'debug build' program

The first thing you need to do before a debugging session is perform a 'debug build' of your program. This ensures that the built-in debugger is able to do its stuff, and it tells the compiler to remove any sneaky code optimisations which might otherwise make it harder for you to figure out what's going on. Go to the Project Options dialog, select the Compiler tab and click the Full Debug button. This sets up all your project options for a debug build.

When debugging a program, don't waste time repeatedly single-stepping through code which you already know works. Instead, set a breakpoint at the place you want to debug from and just run the program to that point.

Also, be sure of the conditional breakpoint facility built into the

integrated debugger. To edit a breakpoint, just right-click on the large red breakpoint marker in the gutter area of the code editor window and choose Breakpoint Properties from the popup menu. This will enable you to create a conditional breakpoint which only triggers when a certain condition becomes true. You can also make use of the Pass Count feature to trigger a breakpoint only after a certain number of passes. Thus, if you want a breakpoint to halt the program only after the processor has visited this code line 100 times, then set the Pass Count value to 100. Again, familiarity with the debugger's various bells and whistles can save you an awful lot of time which would otherwise have been spent tediously tracing through working code.



↑ The Full Debug and Release speed setting buttons provide a quick way of reconfiguring your project for a debug or release build. Be sure to switch back to a release build before distributing your application, or you may end up providing customers with a lot of insights into the inner workings of your program code

before the main window appears. With the help of the Event Log window, you'll see which modules were loaded before the application died. This'll help to track down the source of the problem, identifying the culprit as initialisation code in one of your custom controls.

More typically, you can write your own debug information to the Event Log window. This is somewhat akin to using Visual Basic's so-called Immediate window, if you've got any experience with that development system. The following code snippet shows how to write an OnResize event handler that sends the form's current dimensions to the Event Log window every time that the form is resized:

```
void __fastcall
TForm1::FormResize (TObject
*Sender)
{
    AnsiString Str = "Width =
    " + IntToStr (Width) + " :
    " +
    "Height = " + IntToStr
    (Height);
    OutputDebugString
    (Str.c_str());
}
```

The key routine here is OutputDebugString, which takes a single C-style string (hence the call to the c_str function) and writes the string to the Event Log window. To check for some combination of values that shouldn't happen, a simple statement, like this, will track down the problem:

```
if (x * y > 150)
    OutputDebugString ("Ooops
    at line " + IntToStr
    (_LINE_)).c_str());
```

Notice also that I've used the __LINE__ macro so that you know in which source code line the error occurred. By making judicious use of this routine, you can get a good handle on what's happening inside your application as it executes. **PCP**



Dave Jewell
djewell@pcpmag.co.uk

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NEXT MONTH

More interesting Windows API calls which will enable us to easily achieve spectacular results such as form windows that are non-rectangular, or even semi-transparent effects.



www.pcplus.co.uk/forums/cpp

treated as an unknown variable. To change your score to 1000, just type 1000 into the New Value edit box and hit return. From then, you'll be able to trace through your program and see exactly why you don't get that extra life when the score reaches the magic number!

Just watch It!

One of the most powerful – but neglected – features of the debugger is the Watch List window. A watch makes it easy to see the value of a variable changing as you step through your code. Watches aren't just applicable to simple types such as integers, bytes, and so on, but you can also set up a watch so as to monitor the contents of a record, the first few elements of an array, and so on.

To set up a watch, right-click on a variable name in the code editor (again, this assumes you're currently in debug mode) and this time

select Add Watch at Cursor from the Debug menu. You'll now see the name of the variable appear in the Watch List window, together with its current value. Once you've added an item to the Watch List window, you can double click it to access the Watch Properties dialog. This gives you much finer control over a watched item. For example, if you're watching the contents of a dialog, the Repeat Count field can be used to specify the number of array elements that you want to display and for floating point variables, the Digits field lets you specify the number of significant digits shown.

The mysterious Allow Side Effects checkbox, which is off by default, enables you to specify watch expressions that might generate side effects as a result of their evaluation. For example, if a watch statement involves a function call rather than a simple constant expression, then calling the function could change the

state of other program variables. This option should be used with care since it effectively means the debugger effectively executes bits of your program code even when you don't think that the application is being executed!

The Event Log is your friend...

Another useful debugging aid in C++ Builder is the Event Log window. To make the Event Log window visible, select Event Log from the Debug Windows option on the View menu. As the name suggests, the Event Log window is used to record interesting events that happen while your application is running – just think of it as a black box flight recorder! By default, C++ Builder is configured such that, when an application starts running, it records the names of the dynamic link libraries that need to be loaded before it can start running.

You can see a typical display in the accompanying screenshot. As you can see, a surprising number of DLLs are required to get a C++ Builder program started. The application's built with run-time packages; if you link all needed packages into your program code, you'll see far less modules being loaded when your program starts running. Remember that if you want to cut down on clutter in the Event Log window, uncheck the message categories you're not interested in (Event Log Properties window).

What's the use of this? Well, suppose you've created an application which makes use of custom run-time packages and controls. Suppose the program keels over before it's even started executing properly – for example,



↑ Here's the Event Log window doing its stuff. Normally, (as here) it displays a list of modules loaded at program start-up and unloaded on program termination. However, this stuff can be disabled and you can write out your own custom debug information using the OutputDebugString routine.

A TreeView Ideas Processor: PART TWO

Adding user-defined objects



Huw Collingbourne
continues his Ideas Processor
by adding free-form notes

I ended last month's column by looking at a short program that illustrated how user-defined records might be associated with the items on a TreeView. This was done by creating a pointer variable that references a record. The pointer was then assigned to a node in the TreeView using code similar to the following:

```
Items.AddObject(Items[TreeViewIndex], 'My New Node', MyRecPtr);
```

Here Items is a property of TreeView1 and it is an instance of the TTreeNode class. The Items property maintains the list of individual nodes or 'branches' of the TreeView. The AddObject method of Items adds a new node beneath the node indicated by the first parameter: Items[TreeViewIndex]. The text specified by the second parameter is added as the label or 'heading' of the new node: 'My New Node'. The third parameter specifies the Data property of the new node. A summary of this method is shown in the box, 'Adding Objects To A TreeView'.

If you look up TTreeNode.Data in Delphi help, you'll see that the Data property is a pointer. So, in short, AddObject() creates and displays a new node (a TTreeNode object) in the TreeView. This node has a property called Data which is a pointer to some arbitrary piece of data. This data, by default, is not displayed in the TreeView.

To see this in action, load up the BorlandExample2.dpr project – which is based on code copied from the Delphi help system. The crucial code is found in the AddNodeBtnClick method. Here the Data item is a pointer variable called

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MyRecPtr. This is declared at the head of the unit, to point to a user-defined record of the type TMyRec:

```
PMyRec = ^TMyRec;  
  
TMyRec = record  
    FName: string;  
    LName: string;  
end;
```

The AddObject method is not restricted to adding pointers to records, however. As its name suggests, it can also add objects. To see how this is done, load up the Bexobs.dpr project. This contains much of the code used in the example copied from the help file but rewritten to work with objects.

Now that we know how to associate objects with TreeView nodes, we can get back to our original project – an 'ideas processor' in the form of a drag and drop outliner. I showed how to create the basic outliner last month. This month I want to add the ability to attach free-form notes to the headings in the outline. When the heading is selected, the note will pop up in its own editing panel, separate from the TreeView itself. **PCP**

Huw Collingbourne
huw@pcpmag.co.uk

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NEXT MONTH
I'll be coding my own
saving and loading routines
from scratch

→TV2.dpr project

This month we add the ability to attach free-form notes to the headings in the outline

Load up the TV2.dpr project. This retains the essential features of last month's outliner, such as the ability to add, delete, indent and outdent nodes. Saving and loading has been disabled for the time being, however. This is because the TreeView's SaveToFile() and LoadFromFile() methods which we've used only save the text displayed in the labels of the TTreeNode at each outline level. These methods do not save and load the Data properties of TTreeNode objects.

The TV2.dpr project includes a small edit box into which a piece of standalone text can be entered. Try it out. Use the Add and Add Child buttons to create a few branches on the tree. Select a branch and enter the text 'Hello' into the edit box. Select a different branch and enter the text 'Goodbye' into the edit box. Now highlight each of the branches in turn. Notice that whenever the branch is selected its associated piece of text, 'Hello' or 'Goodbye', is displayed in the edit box. You can edit the text in the box and save the new version by clicking the Change Text button.

Objects of note

Let's see what's going on behind the scenes. Close the application and take a look at the code in the editor. Find the TYPE declaration section at the top of the unit. Here I have declared the class type of a note object. It's a simple class which contains just a single string field:

```
noteob = class  
    txt : string;  
end;
```

In the AddBtnClick method, a noteob object called note is created and its txt field is initialised with the text of Edit1:

```
note := noteob.create;  
note.txt := Edit1.Text;
```

A new node is then added beneath the selected node. Its Data property – the noteob object named note – is specified as the final argument to the AddObject method:

```
Node :=  
TreeView1.Items.AddObject(TreeView1.Selected,  
'NewItem', note);
```

Adding objects to a treeview

It's easy if you use the methods below

You can add objects of all kinds to the nodes of a TreeView by using two methods called AddObject and AddChildObject. These are methods of the TTreeView.Items property which is an object of the TTreeNode class. The syntax of these methods can be summarised as follows:

```
function AddObject(Node: TTreeNode;  
    const S: string; Ptr: Pointer): TTreeNode;  
  
function AddChildObject(Node:  
    TTreeNode; const S: string; Ptr:  
    Pointer): TTreeNode;
```

The AddObject method adds a node beneath the current node at the same level as the node specified by the Node parameter. The AddChildObject method adds a node at one level indented beneath the Node specified by the Node parameter. The S parameter specifies the Text property of the new node. The Ptr parameter specifies the Data property value of the new node. Both methods return the node that has been added.

AddObject returns the newly created node. This is then assigned to the TTreeNode variable named Node. The rest of the code simply places the selection highlight onto this node and puts the label into edit mode to allow the user to change the label's text:

```
Node.Selected := true;
Node.EditText;
```

The text of the noteob object of the selected TTreeNode is changed by assigning the text from Edit1 to the txt field of the object (the Data property) associated with the node. You'll find this code in the ChangeTxtBtnClick method. Notice that the Data property has had to be cast to a noteob type so we can access the noteob's txt property:

```
noteob(Treeview1.Selected.Data).txt :=
Edit1.Text;
```

Now ensure that the txt field of a noteob is displayed in the Edit1 box whenever a node is selected. This has been coded in TreeView1's OnClick event-handler. As you can see, it is simply the reverse of the assignment made in ChangeTxtBtnClick:

```
Edit1.Text :
noteob(Treeview1.Selected.Data).txt;
```

Incidentally, there is one other useful little trick I've used in this project. It would obviously be more convenient to assign any changes made to the text in Edit1 by pressing the [ENTER] key rather than clicking a button. I've coded this behaviour in response to a KeyPress event in Edit1. When the [ENTER] key is pressed the ASCII character #13 is produced. This character is sent as the Key argument to the Edit1KeyPress method. If Key equals #13, the code in his method calls ChangeTxtBtnClick method to do the dirty work.

All change

While this is all very interesting in an academic sort of way, you might be thinking that it isn't really all that useful. After all, entering and editing a single-line of text into an edit box isn't significantly more useful than adding the same line of text as the label of a node in the TreeView itself. It would be a lot more useful if we could add multiple-lines or even whole paragraphs of text. In that way it would be possible to use the outliner to organise our ideas in a simple and clear structure. Long notes could be kept hidden away, only to be displayed when a particular heading is selected.

Well, it turns out that once you know how to attach a one-line note you a TTreeNode, you will have no problem attaching multiple-line notes using precisely the same techniques. The only major revision that's needed is to delete the edit box, Edit1, and add a rich edit box, RichEdit1. Wherever the identifier, Edit1, is used in the code, simply substitute the identifier RichEdit1.

To prove that this really is that easy, take a look at the TV3.dpr project. Find the AddBtnClick method. You'll see that this is the new version of the assignment of a string the txt field to a note object:

```
note.txt := RichEdit1.Text;
```

Run the program. Add a few nodes to the TreeView and enter some text into the rich edit box. This time the [ENTER] key is reserved for moving the cursor to the next line in the rich edit box so I've had to find some other shortcut way of assigning the text to the current node.

I thought it might be useful if the text were automatically added to the node whenever the selection is moved to a different node. This is what I have, in fact, coded. Run the program and click the Add button to add three nodes. Now select the first node and enter the number 1 into the rich edit box, select the second and third nodes and enter 2 and 3 into the box. Don't click the Change Text button. Now click each node in turn. You will find that the numbers you entered are displayed in the rich edit box, showing that they have been 'automatically' assigned to the Data property of each node.

The secret here are the OnChange and the OnChanging events. OnChange occurs when the selection moves from one node to another in the TreeView. OnChanging occurs when the selection is about to move from one node to another. The important difference between these two events is located in the event-handling

methods generated by Delphi. Each of them is passed a TTreeNode as a parameter. The node passed to the OnChanging event handler is the one that is selected prior to the selection being moved. The node passed to the OnChange event handler is the one that is selected after the selection is moved.

To implement the automatic updating of the Data property, I have added this code to the TreeView1Changing() method:

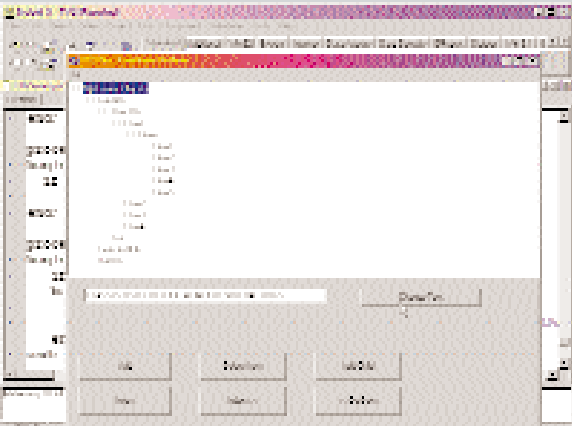
```
noteob(Treeview1.Selected.Data).txt :=
RichEdit1.Text;
```

So, when the focus is about to be moved away from the current node, the note associated with the node is assigned the text from RichEdit1. The TreeView1Change() method contains this code:

```
RichEdit1.Text :=
noteob(Treeview1.Selected.Data).txt;
```

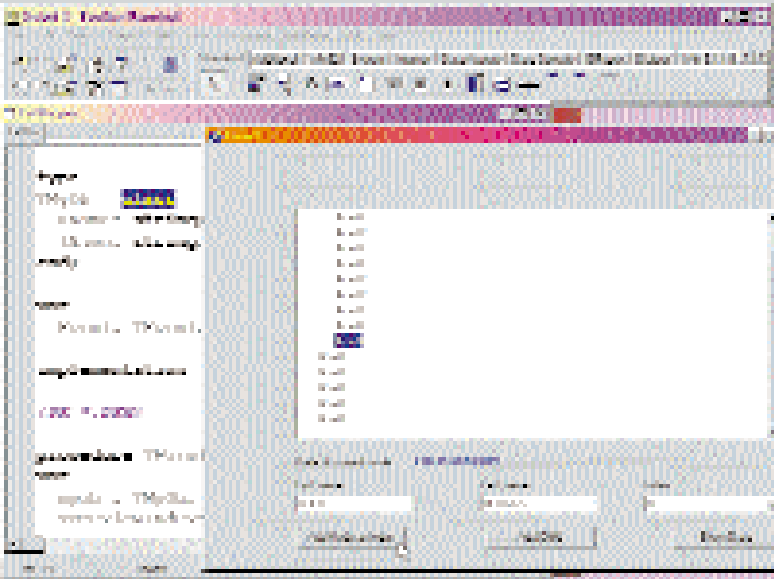
So, when the focus is moved to a new node, the note associated with it is placed into RichEdit1. By using these event-handlers together, I have been able to simplify considerably the editing, assignment and display of notes. The OnClick event handler used in the previous project is now redundant and has been commented out. OnClick only responds to selections made with the mouse. OnChange and OnChanging work equally well with mouse or keyboard selections.

There is still one big deficiency in this applications, however. I have not yet programmed any way for the Data objects associated with the nodes to be saved and loaded to and from disk. As I said earlier, the TTreeView SaveToFile() and LoadFromFile() methods do not save Data objects. So it looks as though I have no alternative but to code my own saving and loading routines from scratch.



◀The tv2.dpr project provides an edit box into which a line of text can be entered. When a button is clicked, the text is associated with the selected node.

▶The first two projects this month adapt code from Delphi's help file to add either user-defined records or objects to the individual nodes of a TreeView.



Java Workshop:PART THREE

Add class to your code by creating new objects



This month Huw Collingbourne delves deeper into objects and becomes a Wrap artist!

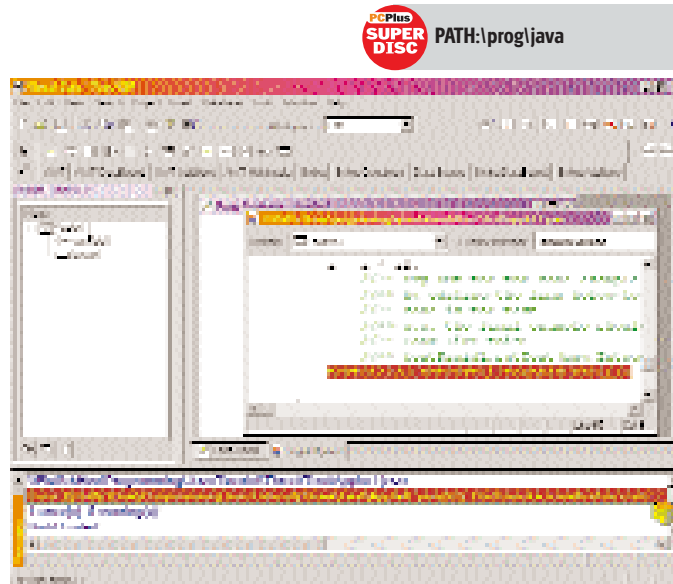
You can try to do all kinds of weird things in computer programs, but you can't do the impossible. For example, while it is perfectly possible to put a string such as 'hello' into uppercase, it isn't possible to put an int (integer) such as 42 into uppercase. And while it makes sense to multiply two integers, it doesn't make sense to multiply an integer with a string.

Go ahead, try it. Load Visual Café and create an AWT Applet project. Drop a TextField and a Button on to the form and double-click the button to create a mouseClicked event-handling method. If you need help on creating projects and event-handling methods, refer to last month's tutorial.

Now enter some code into the method so that it looks like this:

```
void
button1_MouseClicked(java.
awt.event.MouseEvent event)
{
    int i = 10;
    int i2 = 2;
    String s = "2";
    String s2 = "hello";
    textField1.setText(s2.
    toUpperCase());
}
```

Notice that here I have initialised the variables at the same time as defining them. In other languages, such as Pascal, you must initialise a variable and assign it a value separately, which could be



↑ If you try to use a method that's inappropriate – such as changing an int variable to uppercase – an error message is displayed.

something like this:

```
int i;
i = 10;
```

In Java and C++, the above statements are valid but can optionally be compressed this way:

```
int i = 10;
```

Run the program and click the button. If you have any problems, you may want to load the Test.vcp project from disk and run that. As expected, the text field displays 'HELLO'. Edit this line of code:

```
textField1.setText(s2.toUpperCase());
```

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Change s2 to i2 so that the line now looks like this:

```
textField1.setText(i2.toUpperCase());
```

Now when you try to run the program, the compiler displays this error message in the Visual Café Message pane:

Can't invoke a method on a int

The compiler is the tool which changes the program code, which you've written in the editor, into a compressed series of instructions that can be run by another piece of software or by the computer hardware. Normally, Java is compiled into something called bytecode which is then run by a piece of

software called the Java Virtual Machine or JVM. There are JVMs for various different platforms (operating systems and hardware). Java bytecode compiled on one platform, say Windows on the PC, may be executed on a different platform, say Unix on a Sun Workstation. For this reason, Java is said to be 'platform independent'.

In other languages such as C++ and Delphi, the code you enter in the editor is compiled into 'native machine code'. Machine code contains instructions to a particular type of computer hardware – such as a PC.

The disadvantage of machine code is that it cannot be run on other platforms. However, because it operates at a very low level it can speak directly to the computer hardware, which means that machine code normally runs much faster than bytecode.

Making converts

Whether you are using a bytecode or a machine code compiler, the fact remains that code that makes no sense will cause a compilation error. In the present case, the compiler has encountered the toUpperCase() method in the expression i2.toUpperCase(). An integer is a numeric data type and so it does not make sense to try to change its case. For that reason, the compiler has refused to complete the compilation of the program.

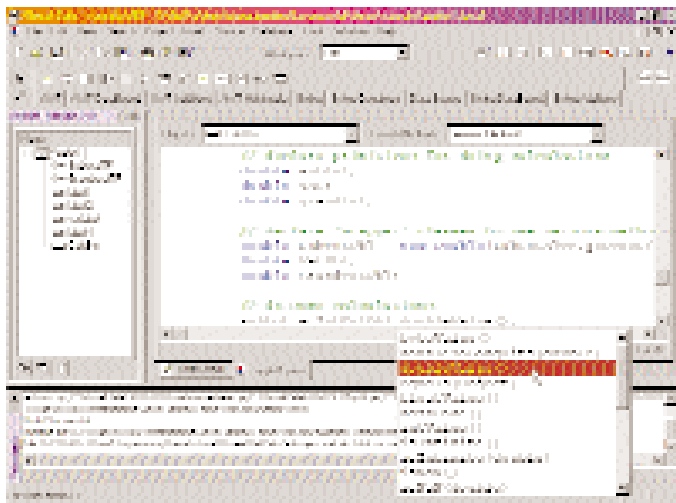
Now, just above the line we've been editing (the one beginning textField1.setText), add this line of code and try to compile it:

```
i = i * s;
```

The compiler fails with the error message Can't convert java.lang.String to int. The value of the variable is 2. While this may look like an int to you or me, it is in fact a String. As far as the compiler is concerned it is no different from any other String such as 'hello' and it makes no sense to multiply it. Change this code to the following, where the int variable i2 has the value 2:

```
i = i * i2;
```

You might think the incompatibility of different data types is perfectly sensible and will never cause any problems. In fact, there are occasions when you will need to translate one data type into another. For example, imagine that you are programming a calculator. Try to display the value of i2 by adding this line immediately after the code you've just edited:



↑ The Double class is a wrapper around a double primitive. Use the `doubleValue()` method to retrieve the actual double value.

```
textField1.setText(i);
```

Once again, you will get an error message stating that an int can't be converted to a String. The int here is the variable `i`. But the `setText()` method requires a String variable. This provides us with a dilemma. We can only perform calculations on numbers, not Strings, so `i` has to be an int. But visual components such as text fields can only contain Strings, not numbers, so the value of `i` cannot be displayed. In order to display the result of a calculation, we have to find some way of converting an int into a String. Go back to the line of code you just edited and change it to:

```
textField1.setText(new Integer(i).toString());
```

When you run the code, the text field will display 20. So what's going on here? Obviously the `toString()` method must have converted the int `i` to its String representation. It is this String which is displayed in `textField1`. Here `toString()` is a method of the Integer class. You can tell this by the fact that the method is 'attached' to Integer by a dot just as the `setText()` method is attached to `textField1` by a dot.

In previous lessons we have used several Java classes such as String and Character. Broadly speaking, a class is the definition of a usable object in the same way that the blueprint of a car defines a usable car. But before the car can be driven or an object can be used, a new car or object must be created from the blueprint or class.

That's what the keyword `new` does. If you delete the word `new` and try to run the code, the compiler complains. The word `new` tells the compiler to create a new object based on the Integer class.

→ Wrapping Up Data

This is a checklist of some of the most common Java primitives and their wrapper classes.

Primitive	Wrapper
char	Character
int	Integer
long	Long
double	Double
float	Float
boolean	Boolean

The `i` in brackets `Integer(i)` passes the int variable `i` as an argument to the new Integer object (it passes it to the `Integer()` method that constructs this new object). The Integer objects to the `toString()` method then acts upon the value of `i` to return its String equivalent.

Whenever an object is created by `new`, a chunk of memory is set aside to contain it. In Java, when the object is no longer needed, the memory is automatically cleaned up and made available for use by something else. In other languages such as Delphi and C++, the programmer has to clean up these chunks of memory explicitly. Failure to do so can make the program run out of memory and can cause bugs. Java's memory-reclamation is called 'garbage collection'. It is one of the things that makes Java easier to use and less error prone than many other languages. **PCP**



Huw Collingbourne
huw@pcpmag.co.uk

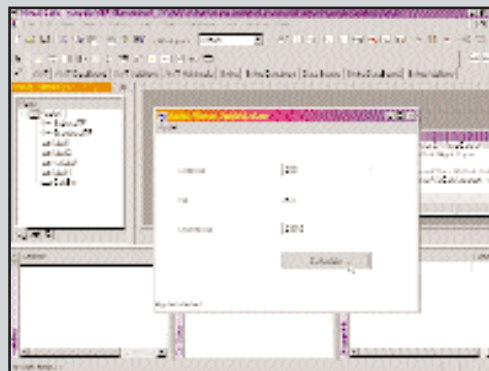
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NEXT MONTH

More Java techniques using Visual Café

→ Make mine a double!

Working out your VAT calculations has never been easier



← This month's final project implements a VAT calculator. Enter a cost into the Subtotal field and it works out the VAT due.

Now let's see how we can use type-conversion to create a more useful program. Load up the `vatcalc.vcp` project. Run it and enter a number such as 50 or 100 into the Subtotal text field. When you click the button, the amount of VAT due on this figure is shown in the Vat label, while the sum of the subtotal plus VAT is shown in the Grandtotal text field. Close the applet and find the `CalcBtn_MouseClicked()` method which is executed when the button is clicked.

This time we are using floating point numbers instead of integers. The variable, `vat`, for example, is declared to be a floating point number of the double type. But notice that later on I have declared another variable called `VatDbl` of the Double type. In Java, double with a small initial is a fundamental or 'primitive' data type representing a simple numerical value. Primitive data types have no methods associated with them. On the other hand, Double with a capital initial is a class and does have methods. You can think of Double as a 'wrapper' that can be put around a double value. In a similar way, an int is a primitive and an Integer is a wrapper class. When you want to use methods on a primitive, you can use its wrapper class. A list of primitives and their matching wrapper classes is shown in the box 'Wrapping Up Data'.

The Double object `SubTotDbl` is declared and initialised with the text from the `SubTotalTF` field in a single statement:

```
Double SubTotDbl = new Double(SubtotalTF.getText());
```

This statement begins with the variable, Double. It creates a new Double object named `SubTotDbl`. The statement `Double(SubtotalTF.getText())` calls the `Double()` constructor method. In Java the methods that construct objects use the name of the class – here Double – followed by a pair of round brackets. Sometimes the brackets can contain an argument. A new Double object can be passed either a double primitive such as 1.00 or a String such as 1.00. When a String argument is passed it is automatically converted to a double if this is possible. If the String is inappropriate – for example, 'Hello world' – an error occurs.

The other Double objects, `VatDbl` and `GrandTotDbl` are declared at the start of the code but the actual objects themselves are only created using 'new' and initialised with double values later on:

```
VatDbl = new Double(vat);
```

The `VatDbl` object uses the `toString()` method to return a String version of the double variable, `vat`:

```
vatlabel.setText(VatDbl.toString());
```

Take some time to look at this code to understand how primitive double values are used for doing the calculations whereas their Double wrapper classes are used whenever a method such as `toString()` is required.

There is one other thing to note here, too. The value of `VATRATE` is constant. Whereas the values of variables such as `vat` and `grandtot` will change each time the program is used, `VATRATE` must always have the value 0.175. In many languages a constant value such as this is declared using the keyword 'const'. In Java, the keyword 'final' is used:

```
final double VATRATE = 0.175;
```

This ensures that the value of `VATRATE` cannot be accidentally changed. Once the `VATRATE` constant has been declared, it cannot be altered. If you enter this statement, the compiler produces an error:

```
VATRATE = 0.176;
```

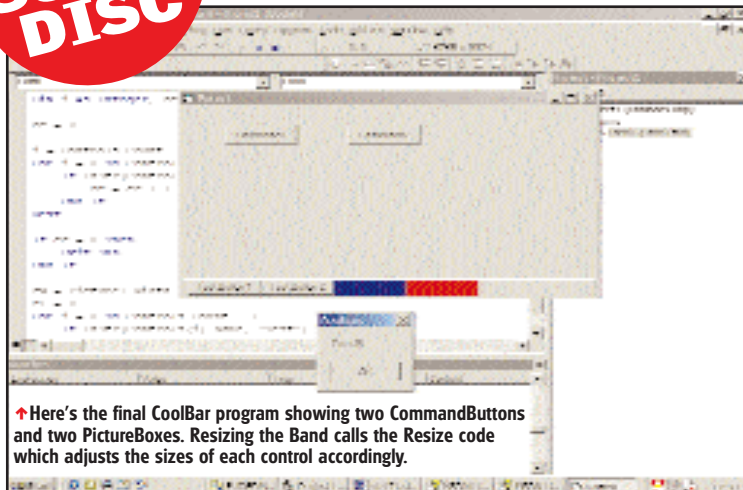
Now that we know how to create objects from existing, we are ready to start creating our own new classes from scratch. This is where object orientated programming really gets interesting. As we'll see next month.

CoolBars:PART ONE

Visual Basic Workshop



Dermot Hogan delves into the world of CoolBars



In Windows, CoolBars are all over the place. You can see them in Internet Explorer, Word and you'll also see that the Windows Taskbar itself is a CoolBar. In contrast to the Toolbar control I looked at last month, you can do far more with CoolBars – and they look better. The bad news is that they aren't very easy to program. They're not too difficult, but you do need to put some effort into making them work.

The CoolBar control acts as a container for other controls. Visually, CoolBars are divided into Bands: the Band 'edge' is the thing you grab with the mouse to resize a section of the CoolBar. The main difficulty comes from the restriction that a CoolBar Band can't hold more than one child control. To get round this, you have to use another container control (like a PictureBox) to hold the multiple child controls.

The first thing to do is create a CoolBar and populate it with a couple of buttons. Initially, I won't put multiple child controls into the CoolBar so I can illustrate the basics. In a new project select Components from the Projects menu and check Microsoft Windows Common Controls-3.6.0 and click OK. This adds the CoolBar control to the Toolbox and creates a CoolBar on the default form. Add a CommandButton and set its Click code as in the code corner.



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I've used the Visual Basic Controls to create a new CommandButton. You can create other types of control by setting the first argument to the COM program identifier or 'progid'. For example, to create an intrinsic TextBox control, use VB.TextBox as the progid. You can also create other, non-intrinsic controls by using the appropriate progid.

The second argument of the Add method is the control's name in the collection – no two controls can have the same name. The third argument (which is optional) sets the container for the control. If this is omitted, the container would hold the Controls collection, in this case, Form1. But, we want the container to be CoolBar1. **PCP**



Dermot Hogan
dhogan@pcpmag.co.uk

PCPlus

NEXT MONTH

I'll look at using OLE drag and drop techniques to create a program launcher using the CoolBar code I've developed this month.

→ Creating commands

Create your own commands with the help of a standard CoolBar program

If you run this, you'll initially see a basic, empty CoolBar. Click on the Command1 button and the CoolBar will sprout CommandButtons in Bands 1 and 3. But if you click them, nothing will happen. So how do you get the buttons in the CoolBar to do anything? The trick is declare the object variables c1 and c2 as CommandButtons using the WithEvents keyword:

```
Dim WithEvents c1 As CommandButton, WithEvents c2
As CommandButton
```

Now you can use the standard CommandButton Click code (the complete project is Coolbar1.vbp on the **Superdisc**):

```
Sub c1_Click()
MsgBox "I've been clicked!"
End Sub
```

The WithEvents keyword is a bit peculiar. There are a number of not too obvious restrictions on its use, for example, you can't create arrays of WithEvents variables. Also, to my mind, it's not clear why you need to use WithEvents at all. Visual Basic clearly knows that an object is a control, so you should be able to type in code for the control's event handlers without having to use yet another keyword.

Picture this

Using this simple mechanism for creating controls dynamically on a CoolBar, we can move on to creating multiple controls within a CoolBar band. Now a Band can only contain one child control – so the way out of this is to make this single child control a container. Almost any container will do, but the simplest one for our purposes is a PictureBox.

Starting from the Coolbar1 project, select a PictureBox control from the Toolbox and drag it onto the second CoolBar Band on the bottom left hand side of the CoolBar control. This creates a child control in the second Band. Now right click the CoolBar and select Properties to display its property page. Select the Bands tab. Move the Index value to 2 (to select the second band: the CoolBar is created with three bands by default). From the Child ComboBox select Picture1.

Add a second CommandButton, Command2, and add the following code to its Click event:

```
Dim c As PictureBox
Set c = CoolBar1.Bands(2).Child
Set c3 = Controls.Add("VB.CommandButton",
"cmdTest3", c)
Set c4 = Controls.Add("VB.CommandButton",
"cmdTest4", c)
```

This is similar to adding controls dynamically to the CoolBar as we did above, except that the container argument of the Controls.Add method is set to the PictureBox control. However, you now have to set the new CommandButtons' properties explicitly, otherwise they end up invisibly on top of one another in the PictureBox. Here's the code for the first – and the second is similar:

```
c3.Caption = "TB3"
c3.Height = 144
c3.Visible = True
c3.Width = 600
c3.Left = 0
```

The complete code is in the Coolbar2 project. If you click Command2, you'll see two buttons appear in the second Band of the CoolBar (you'll have to drag the right bar to see both controls fully). That's the basics but there's quite a bit more hacking to do in order to get something that looks a bit more usable.

A cool CoolBar

By default, a newly created CoolBar has three Bands on two rows. You can add or remove Bands as required by using the properties page. Right click on the CoolBar control and select Bands. Delete two of the Bands by clicking Remove Band, and then add a new Band, ending up with two Bands in a single horizontal CoolBar. I want to make the CoolBar 'stick' to the bottom of the form and resize correctly as the form resizes. This is simply done by setting the CoolBar's Align property to vbAlignBottom.

The next job is to get the two PictureBox controls to merge in with the CoolBar's background and to occupy some space. You do this by setting the Properties of each PictureBox as follows:

```
With Picture1
    .Appearance = 0
    .BorderStyle = 0
    .BackColor = &H8000000F
    .Width = 3000
    .Height = 300
End With
```

and similarly for Picture2. The CoolBar must also have its properties set to correspond:

```
With CoolBar1
    .Bands(1).MinHeight = 300
    .Bands(1).Width = 3000
    .Bands(2).MinHeight = 300
    .Bands(2).Width = 3000
End With
```

Now we get to a tricky bit. When a CoolBar band gets resized (either by dragging the Band border or by resizing the entire form), only the PictureBox controls are resized. Any controls inside a PictureBox are left at the original size. You have to trap the resize event and do the necessary resizing calculations and coding yourself.

But the thing to notice is that there are two resize events – one for the CoolBar as a whole (i.e. when the form is resized) and another for the PictureBox containers. The PictureBox is resized automatically by the CoolBar and it's this one, the PictureBox Resize event, that we've got to work with in order to resize its child controls.

When the Resize event of the PictureBox container is triggered, the controls held within the PictureBox must be examined and their locations and sizes re-calculated. But another problem arises – how do you know which controls are contained within the PictureBox? In a sensible system, you would be able to use a 'child' property of a container object to pick up a list of child objects held by the container. While Visual Basic is just about the fastest and best development environment around (in my totally unbiased opinion – and I've used them all at one time or another), the internal elegance and logical consistency of the language isn't that great.

In Visual Basic, there are real containers called Forms and other containers like a PictureBox that are 'second class'. Only Forms have a Controls collection which lists all on the controls contained within the Form. What you want to say is something like:

```
For i = 0 To Picture1.Controls.Count ' incorrect!!!
```

Instead what you have to do is either keep your own personal collection of controls being held in a PictureBox container or use the Form Controls collection. I'll use the Control collection here.

The Resize subroutine first determines the number of controls that have been placed in the Picture1 container:

```
cc = 0
i = Controls.Count
For i = 0 To Controls.Count - 1
    If InStr(Controls(i).Name, "Test") > 0 Then
        cc = cc + 1
    End If
Next
```

All the controls that I've created in the PictureBox have the text Test in their names. It's not a particularly elegant method but it serves

Code Corner

Click code

```
Dim c1 As Object, c2 As iObject
Set c1 = Controls.Add("VB.CommandButton", "cmdTest1", CoolBar1)
c1.Caption = "Test Button 1"
Set CoolBar1.Bands(1).Child = c1
Set c2 = Controls.Add("VB.CommandButton", "cmdTest2", CoolBar1)
c2.Caption = "Test Button 2"
Set CoolBar1.Bands(3).Child = c2
```

the purpose. Next, after a check for no controls at all, the width of each resulting control is decided and then positioned. You could put a small 'filler' in between each control, but here I've just butted them closely together:

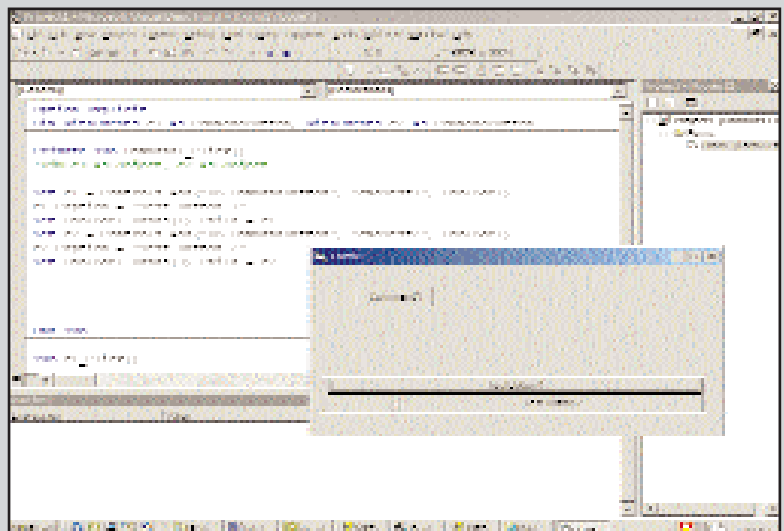
```
cw = Picture1.Width / cc
c1 = 0
For i = 0 To Controls.Count - 1
    If InStr(Controls(i).Name, "Test") > 0 Then
        Controls(i).Left = c1
        Controls(i).Width = cw
        c1 = c1 + cw
    End If
Next
```

As I mentioned earlier, you don't need to stick to CommandButtons in a CoolBar. Sometimes it's better to include a simple object such as an Image control or another PictureBox. I've added another button, Command2, which uses a similar technique to include PictureBoxes rather than CommandButtons:

```
Set c3 = Controls.Add("VB.PictureBox",
    "picTest1", c)
With c3
    .Height = 288
    .Visible = True
    .Width = 1200
    .Left = 0
    .BackColor = &HFF0000
    .BorderStyle = 0
End With
```

With a PictureBox, you can write your own graphics onto the control, rather than being stuck with the format and layout of a CommandButton. In this example, I've just used simple background colours to illustrate the effect. Clicking on a PictureBox control has the same effect as a CommandButton: you can trap the click by declaring the control WithEvents.

↓ The basic CoolBar operation just contains one child control per Band. Here, two CommandButton controls have been generated dynamically and placed in Bands one and three.



www.pcplus.co.uk/forums/vb



WILF'S WORKSHOP

Forget everything you know about programming – there is another way of performing computations.

Wilf Hey examines robots



Robotic Memory

In last month's workshop we built a simulation of a very simple robot. This automaton was armed with no memory except a brief summary of how to move in response to the feedback from eight sensors, yet when it met with an obstacle in its path it would travel around its perimeter endlessly. We discussed that it may be able to work a little more intelligently if it had something of a memory: it could then 'remember' when it was about to repeat itself, and be able to take another course of action. In this way, the robot would not go on repeatedly taking the same actions forever.

It surprises people that even such a simple robot can accomplish interesting tasks. In Jerome K Jerome's famous book *Three Men in a Boat*, Harris, the know-it-all, announces that he knows how to find his way into the area at the centre of the Hampton Court garden maze which has large hedges as walls: simply make sure your left

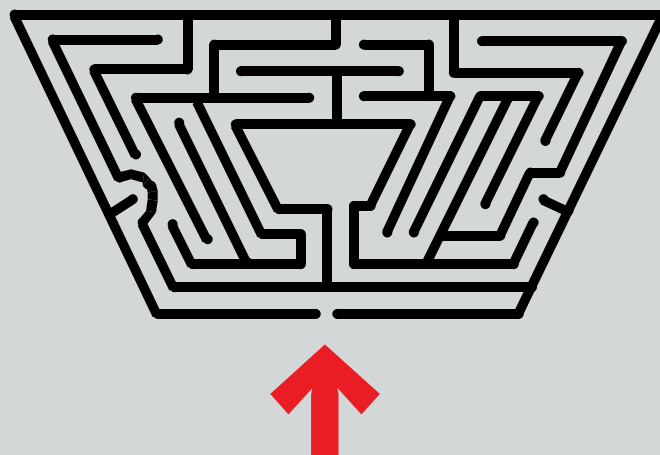


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hand is touching a hedge at all times, and walk forward. Though he ultimately suffers embarrassment, Harris is correct: this simple algorithm, similar to the rules which govern our Robot1, works with highly-connected mazes, of which the garden maze at Hampton Court is an example (or strictly speaking, nearly an example).

Put on a Happy Face

A more sophisticated version of our walkabout robot (call it Robot2) will work on the same basic principles: blessed with no memory, and with no advance knowledge of the environment, Robot2 has a simple set of rules and some sensors. The big difference now is that Robot2 has a face. Robot1 obeyed its rules by matching sensory input from directions: North, East, and so on. Robot2 knows directions, but relate them to its face: left, right, in front, behind. The rules not only tell



↑ Jay's friend Harris was right: you can get to the centre of the Hampton Court maze by keeping your left hand continually in touch with a hedge. It is a fairly easy task to create a robot with this capability.

which direction to move, they tell the way to face as well.

It is not difficult to put the changes into Robot1's simulator to create a Robot2. You may recall that the special environment created for Robot1 doesn't have too many complications. Obstacles exist, but there are no ambiguous conditions where two obstacles are close enough to create a gap only one unit wide.

Robot1 is so dim that it could become confused if it hit two obstacles simultaneously, one on each side. For example, if it entered a corridor between two walls, it could never go back out of that corridor (because it would want to move the same way every time it arrived on any particular square). There are in fact exactly 13 conditions in which Robot1 could find itself:

- On a square with no obstacles sensed on any side or corner (one type)
- On a square with exactly one wall sensed (four cases: North, East, South and West)
- On a square with exactly two walls, meeting at a point (four cases)
- On a square sensing an obstacle at one point (four cases)

All we had to do was set up a rule for each of the thirteen cases, and Robot1 was amply qualified to tackle its environment. You may

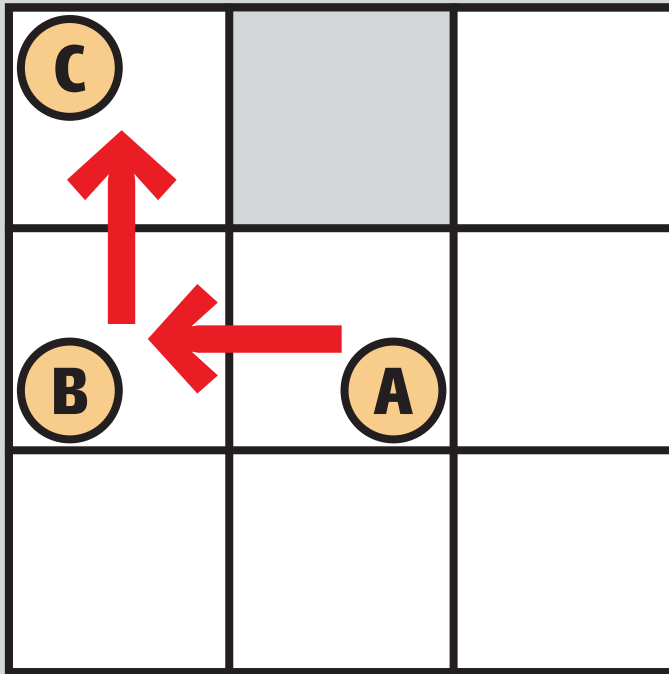
remember that we set the robot so that it would continue in any of eight directions while it sensed no obstacles, but tended to follow around the perimeter of the first obstacle it met, clockwise, forever thereafter. Let's set rules for Robot2 so that it can at least do as much as Robot1.

In the case where there are no obstacles, Robot2 can just continue in its forward direction. Robot1 had only one type of response to make in each case: it chose a neighbouring cell to occupy.

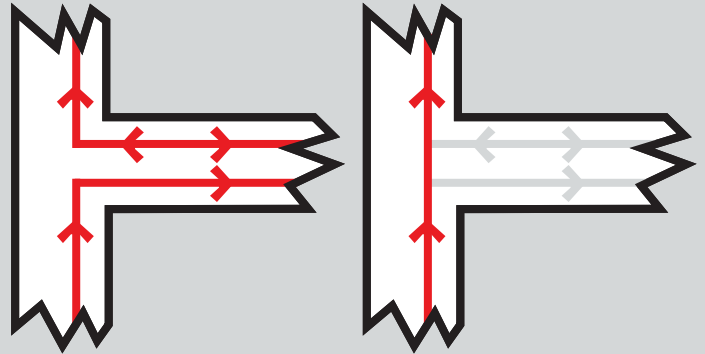
Robot2 has the luxury of two different types of response: it can turn to face a new direction, or it can move to a neighbouring cell or both. Let's program it so that when Robot2 senses a wall directly in front, it simply turns to the left. If it is not facing a wall, it can move forward one cell. This simple tactic takes in almost all cases. When it comes to a wall, it will turn until its way is clear.

Now this isn't quite the same as Robot1 though, because with these instructions Robot2 will not hug the perimeter of the obstacle. To emulate Robot1, our new automaton will also have to consider the case when the way ahead is clear, the way to the right is clear, but it senses an obstacle behind and to the right. In this case it must turn to the right. If it went forward instead, it would be going away from the obstacle, rather than following round it.

If you compare the rules used for each robot, you should see the following differences:



← Both Robot1 and Robot2 follow the perimeter of any obstacle, going clockwise around it. Robot1 must have rules for moving from A to B and from B to C, sensing where the wall of the obstacle is, and each rule is multiplied by four (for the four directions). Robot2 can accomplish the same thing, but with simpler rules.



↑ Suppose a robot with a memory recognises that it has reached a particular place a second time. With appropriate 'thinking tools' it can revise its strategy so that the next time it sees this environment, it can omit the action that took it down that 'blind alley'.

Robot1 has two different kinds of rule for when it senses walls on the side: it has to know whether there is just one wall, or two walls joining at a point. Robot2 does not always move: its response can simply be to turn, so it can get by with only one kind of rule in this circumstance.

Robot1 has four different versions of its rules to cope with the four cardinal points on the compass. Robot2 knows left from right, and no longer needs to know compass points. One rule for 'a wall ahead' takes the place of four rules.

All this comes down to much greater efficiency: knowing left from right (in other words, 'having a face') means that Robot2 only needs three rules to describe what it has to do where Robot1 needed 13 rules.

Robot wars

Not only that, it turns out that Robot2 can get out of jams that would completely befuddle Robot1: when placing random obstacles in the environment, I had to make sure that I didn't accidentally create one of these troublesome spots for Robot1, but Robot2 could handle them with ease.

Think about it: what would Robot1 do if it found itself in a cell with walls on three sides? It would not know what was going on, since none of its rules would apply. Robot2, on the other hand, would simply turn to the left and keep doing this until it was facing the one direction possible for it to go. It would happily leave the scene, then turn the corner and continue

around the obstacle it had encountered. In the same way it could handle tunnels.

Robot1 would not know what to do if it sensed a wall on both its North and South neighbouring cells. Robot2 would turn left until it faced a free direction, and then march onward in that direction. If it later approached the same tunnel from the other direction, it could act appropriately and travel in the opposite direction to previously.

We can exploit this tunnel travelling ability in a crafty way that simulates the intelligence of truly 'thinking' creatures. If we let Robot2 loose in the Hampton Court Garden Maze, it will hug the right hand wall, and turn left whenever it runs into another wall immediately ahead of it. If it takes a cul-de-sac, when it gets to the end, it will turn 180 degrees and trace its way back out.

With a fully-connected maze of this sort, Robot2 will always be going deeper into the maze, or else retracing its route away from a dead end. As long as the walls of the maze are effectively one piece, Robot2's strategy is absolutely guaranteed to lead it to the middle. As a matter of fact, these rules will guarantee that the automaton visits every possible place in the maze. (The Hampton Court Maze walls actually form two pieces rather than one, but it happens that this doesn't change much: it simply means there are some places, those bordering the second, shorter, set of walls, that Robot2 will never visit).

Now you may think that an automaton that goes down every

single blind alley in a maze is hardly a good companion. But you would be wrong. Now think of a lab rat being put into a maze, with a reward of cheese at the end. The first time she sees the maze, she cannot know which turns are futile and which are productive. However when entering the maze for the second time the following day, she will know to ignore the dead ends. Now here is where the tactic pays off: if Robot2 can be bothered to remember the dead ends, it will be able to easily avoid them next time and, since it knows each and every dead end, it can whizz through the maze perfectly second time round, with nary a false turn.

What a maze-runner robot will have to do is keep a mental map of its environment, so that it can know when it gets to the same cell (or place) a second time. On the following occasion that it runs through the maze, the robot will know, the first time it gets to that cell, that it is futile to take the normal path, and therefore it will know to skip it.

In the book *Three Men in a Boat*, Harris approaches the maze with a variation on Robot2's strategy: he follows walls to the left, which is anticlockwise, but the result is the same. He is guaranteed to take every wrong turn and blind alley possible, but he is also guaranteed to get to the centre eventually. Furthermore, if he takes a little notebook and simply ticks off each intersection as he gets to it, he can repeat the performance with record speed the next time he

goes to Hampton Court (unless they alter the maze), ignoring all the blind paths and going straight to the centre.

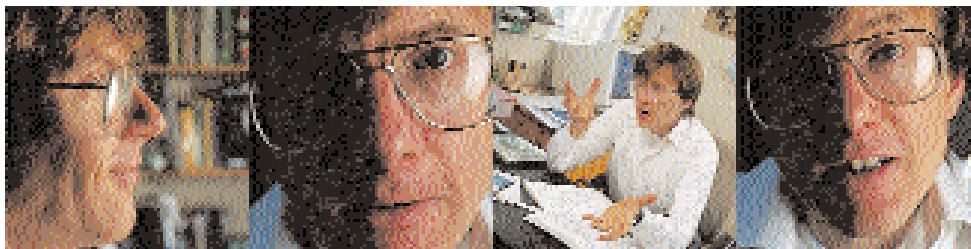
It seems that this 'revising' robot may be a good maze-runner, exhibiting trial-and-error skills and the ability to learn from abortive actions. Yet it is just Robot2 with a glimmer of mapping ability added. And of course Robot2 is itself just Robot1 plus a built-in understanding of left and right.

What about other applications of mapping ability? In our little layout of cells and obstacles, we could make a task this is slightly more complicated than one that Robot1 could ever hope to accomplish. Robot1 was 'smart' enough not to run into an obstacle, but instead circle it – forever.

What about a robot that will continue on its original path once it gets the other side of the obstacle (that is, if it gets to the other side)? We will consider that – and some implications of the English language on logical decision making – in the continuation of this article on the **SuperDisc**.

Write in!

→ I'm always pleased to receive letters and e-mail with programming queries, ideas and opinions. As a strict rule I can't reply directly with personal one-to-one programming advice, but your input could form the basis of a future Workshop. You can e-mail me at whye@pcpmag.co.uk. Fax to 01225 732295 or write to Wilf's Workshop, **PC Plus**, Future Publishing, 30 Monmouth Street, Bath BA1 2BW.



Huw Collingbourne

Huw Collingbourne goes in search of Elvis and finds Limahl. Well, you have to admire his bare-faced cheek!

Elvis Aris had a unique talent. He did impressions of famous people with his bare bottom. It's true he did occasionally resort to a few choice props – a wig for Elvis Presley and a well-placed cigar for Sir Winston Churchill. Other than that, his impersonations were performed without artificial aids. I know this for a fact. Once upon a time, I was Elvis Aris' manager.

I thought I might as well get this out into the open now. After all, it's only a matter of time before some reader unearths my seedy past and complains to the editor that I am an unfit person to write for such an illustrious magazine as **PC Plus**. Of course, I could deny it all. But, unfortunately, with the advent of the Internet, the ghosts of one's past never fade away. They hang around to haunt you in cyberhell.

Little did I suspect in those far off days before the advent of the Web and the all-pervasive evil of e-mail that the follies of my youth would pursue me well into the madness of my middle age. But it's no good denying it. The '80s pop star, Limahl, really did share a settee with me

and treat me to a private viewing of his tummy muscles (www.limahl.co.uk/articles/muscles.htm). And yes, I really did share makeup tips with David Sylvian, the sultry crooner with mega-group, Japan (<http://vzone.virgin.net/japan.assemblage/historyo.htm>). Elsewhere on the Web there are extracts from my more or less embarrassing encounters with a host of

"I like the idea of showers of stoned koalas raining down from trees and falling to the ground with a plopping sound"

other celebs of yesteryear and I have no intention of providing links to them! Suffice to say, most of these not only make me sound like a prat but (if you glance at the dates of the articles), they make me sound like an old prat, which is even worse!

Privates on parade

It's embarrassing enough for a run-of-the-mill hack like me to see slices of my past dusted down and paraded across the Internet for anyone to scoff at. How much more embarrassing must it be for stars of the magnitude of Elvis Aris?

At the height of his career, Elvis Aris' talented bottom graced magazine covers, newspaper centrefolds and even live TV shows (always absent-minded, Elvis once caused consternation on the James Whale TV Show when he went on air without his customary G-string). I have to admit that Elvis and I have lost touch in the years since our careers took diverging paths – mine into the glittering world of computer journalism, Elvis is into... well, I'm really unsure of what has become of him. But dash it all! If the Internet is seething with the seedy secrets of my own tawdry past, surely it must be crawling with Elvis Aris memorabilia!

Before the advent of the Internet, it would have been an almost impossible task to track down a long-lost old acquaintance such as Elvis. But now, it just takes a few well-chosen phrases

entered into a few well-chosen searching engines (www.alltheweb.com, www.northernlight.com, www.lycos.com etcetera) and...

I soon discovered that Elvis Aris' last known appearance on the Internet was in December 1999 when he did a short stint as a columnist for an online celebrity gossip magazine, Planetfame (www.planetfame.com). I have to say that this is a sad decline from the glory days of his career. Gone are the TV shows and the centre spreads. These days the man is reduced to being a mere online hack. But, much to my astonishment, I can't find a single actual photograph of one of Elvis' remarkable impersonations.

Another way of finding old friends on the Net is to use one of the e-mail searching tools such as Bigfoot (www.bigfoot.com) or Whowhere (www.whowhere.com). Using one of these, you can enter a person's name and then search for their e-mail address. These search tools are very much biased towards American residents however, and neither of them located Elvis Aris.

If you make frequent use of search engines you will know that the results they produce are extremely variable. For example, some engines were able to find no mentions at all of Elvis Aris. Others found a couple of dozen references.

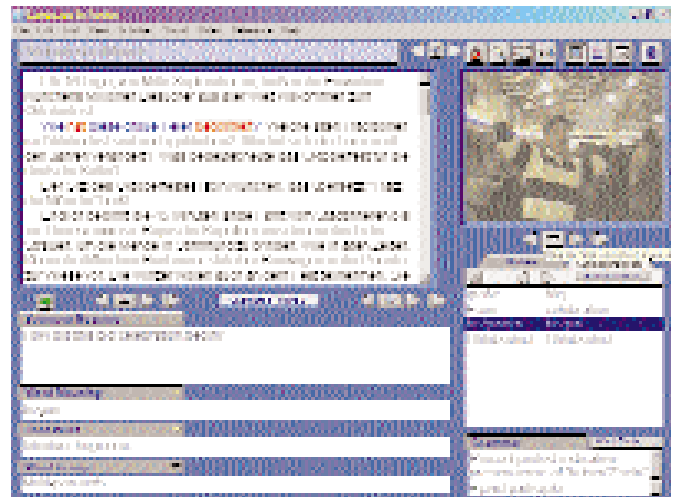
Ironically, perhaps, one of the things I've been using search engines for recently is a better search engine. If any readers know of a better search tool, please let me know. Here's a challenge for you. See if you can a) track down an online photograph of Elvis Aris or b) an even more cringe-making ghost from the Collingbourne past than my interview with Limahl. You want a prize for the best effort? Hmmm, well maybe I could run to a signed photograph of Elvis Aris (if you could face such a prospect, that is!)

Bear necessities

They don't get high on cocaine, mere alcohol doesn't thrill them at all. What koala bears do get a kick out of is leaves. Eucalyptus leaves, to be specific. At least, that's what Old Fred told me. And he's the kind of man who knows these things.



↑ Former teenage heartthrob, Limahl, had a dodgy hairdo but nice tummy muscles. I know for a fact. I've seen them!



I met Old Fred out in some of the wilder wilds of Queensland some years ago. In the shade of gigantic gum trees, he told me that koalas (which are not bears really) are the drug addicts of the animal kingdom. Their idea of a good night out is to climb up a tree, get smashed out of their furry little heads on leaves, and then spend the rest of the night trying not fall off again. Not all of them succeed.

To this day, I don't know how much of that is true and how much Old Fred was making up to fool a gullible Pommy. But I have to say that I rather like the idea of showers of stoned koalas raining down from the trees and falling upon the ground with a gentle plopping sound!

A book called HTML & XHTML The Definitive Guide 4th Edition might not seem to be the obvious source of information on koalas. So I admit to being surprised by the amount of detail it provides on the koala's diet. It seems that koalas will only eat the leaves of about 20 of the 350 species of Eucalyptus in Australia. The leaves contain chemical precursors of cyanide and, in order to avoid being poisoned, they have to eat soil too. The book doesn't say whether or not koalas really do get high on the leaves. Only the koalas know for sure. And they ain't saying.

HTML & XHTML The Definitive Guide is a newly published book from O'Reilly. All the books from this publisher feature old woodcut pictures of animals on the cover. The animals on some of them have at least a tenuous connection with the subject matter of the book. JavaScript The Definitive Guide, for example, features a picture of a Java rhinoceros. I haven't been able to figure out what, if anything, koalas have to do with HTML. Maybe it's intended as a comment on the mental state of HTML developers?

While the cover of O'Reilly's books may be eccentric, the content is almost always of a very high standard. The koala book does an excellent job of covering the essential features of the varying flavours of Web page formatting languages and includes a short section on JavaScript for good measure.

There are, of course, innumerable books devoted to programming the Web using JavaScript. Many of these books are incredibly big and complicated – which is odd, really, bearing in mind that JavaScript is a fairly small and simple language. The newly released third edition of JavaScript Unleashed is, comparatively speaking, a slim volume at just under a thousand pages. It does a good job of guiding the newcomer programmer through the basics and onto some moderately complex coding techniques. But it takes too leisurely an approach for my tastes. I can't help thinking it would be a better book if it were condensed to half the size.

A more satisfactory book is O'Reilly's JavaScript The Definitive Guide (the one with the rhinoceros). But if I were to choose just one book on HTML and JavaScript, I'd go for O'Reilly's Dynamic HTML The Definitive Reference (the one with a flamingo). This provides a genuinely comprehensive overview of HTML, JavaScript and style sheets. It isn't quite as up to date as the more recently published XHTML koala book and it's not as hand-holding as JavaScript Unleashed. All the same, it is the most useful book on the subject that I have come across.

Mind your language!

Computer languages may be complicated. But nowhere near as complicated as spoken languages. Linguaphone, one of the most famous publishers of language learning courses, has recently branched out into computer-based multimedia courses. The In Action series provides on-screen text, video and audio to ease a learner into the language without having to go through rote-learning of verb tables and vocabulary.

As a novice in German, I decided to give German in Action a whirl. This lets you watch a short video drama in one window while reading the script in another. There are puzzles and games to play, simple grammar notes and a listen-and-repeat tool to let you test the accuracy of your pronunciation.

It definitely isn't going to replace those big, traditional Linguaphone courses comprising half a ton of books and audio

cassettes. If you are looking for a more complete self-study computer course, I'd advise you to invest in a copy of one of the Learn To Speak courses. They are much more structured and detailed than the Linguaphone courses and even come with a useful printed workbook to let you revise when you aren't at the computer.

There is an argument that learning a foreign language is a wasted effort for anyone who speaks English as their mother tongue. French may be the language of diplomacy but English is the language of the Internet. English is now the modern Esperanto. So maybe the rest of the world's languages have outlived their useful lives and should be left to die with dignity...? (Provocative? Qui, moi?)



huwcol@aol.com
www.treetops.u-net.com

↑ **German In Action** provides a gentle introduction to the language and culture of Germany including the arts of serious boozing.

Contacts

FURTHER READING

If you need to contact any of the suppliers of the products mentioned here, take a look at the following resources

HTML & XHTML THE DEFINITIVE GUIDE 4TH EDITION
by Chuck Musciano and Bill Kennedy
Price £23.50
O'Reilly: 01252 711776
www.oreilly.com

JAVASCRIPT UNLEASHED 3RD EDITION
by Richard Wagner and R Allen Wyke
Price £36.50
SAMS/ Computer Manuals: 0121 7066000
www.sampublishing.com
www.computer-manuals.co.uk

GERMAN IN ACTION
Price £24.95
Linguaphone 020 8333 4900
www.linguaphone.com/inaction

LEARN TO SPEAK (GERMAN, FRENCH OR SPANISH)
Price £50 (£42.55 ex VAT)
The Learning Company: 01293 651300
hwww.learningco.com



↑ The CDR-1232. Write MP3s to your CDs. As if you weren't already doing it

CD-RW DRIVE

AOpen CRW-1232

PRICE £206 EX VAT £175 SUPPLIER SMC Direct
PHONE 0800 435978 WWW www.aopen.nl

AOpen's new machine claims to be one of the fastest products on the market.

Hmmm. 12x10x32xMP3 CD-Rewriter, the box informs me. Never heard of one of those before. 12x write and 10x re-write sounds pretty damn good. Not too sure what an MP3 CD drive does as yet, though. Upon plugging this drive into the office's over-stressed test machine, it looked like

.....

Tested on
PII 350MHz, Windows 2000

quite a good job. Nice quick write speeds, a good bunch of software to add to the mix. Admittedly, the user manual is only four pages long, and full of big pictures but, then again, installing a CD drive isn't exactly rocket science is it?

When it came to our tests, performed by the ever-reliable CD-Tach, this drive returned a measly read speed of 18.2x, which is definitely under the manufacturer's specifications for this unit. That said, the write speed is impressive, burning an entire CD in a fraction under 10 minutes. AOpen's technical support labs in Holland have informed me that using CD-Tach with this drive on a GX motherboard has returned speeds of 32.2x. We couldn't replicate this in our tests. CD-Tach determined access times of 186ms at full stroke, and 103ms in random access. These times refer to how long it takes the drive to locate a specific piece of information on the disk, and show that this unit is actually pretty quick when it comes to data access.

Apart from the poor documentation, the tools supplied with the drive are pretty good. Ahead Software's Nero 5 Burning Rom is an excellent tool for creating CDs, with a handy little bar that displays the amount of data currently in the 4MB buffer. This would be even better if the drive was burn proof, but it isn't, so all you can do is sit helplessly as you watch the buffer empty out, trashing yet another CD. And I wasn't even doing

anything in the background.

Also included in the package is Gamut 2000, by Formosoft International, which is an audio player for Windows in the style of Winamp. It has a few nice effects that can be laid on to your MP3s, and interchangeable skins and visualisation plug-ins.

The CRW-1232 is not a bad product, but is let down by a few points. It is marketed as the total MP3 solution, but is no more so than any other CDR/CDRW, when used with the correct software tools. With a few additional features, such as burn proofing, this could have been the big daddy of optical technology for the home market, instead of just another contender.

Joe Lees

PCPlus Verdict

AOPEN CRW-1232

✓ FOR

→ Potential speed
→ Good software included

✗ AGAINST

→ Varied speeds
→ Not burn proof

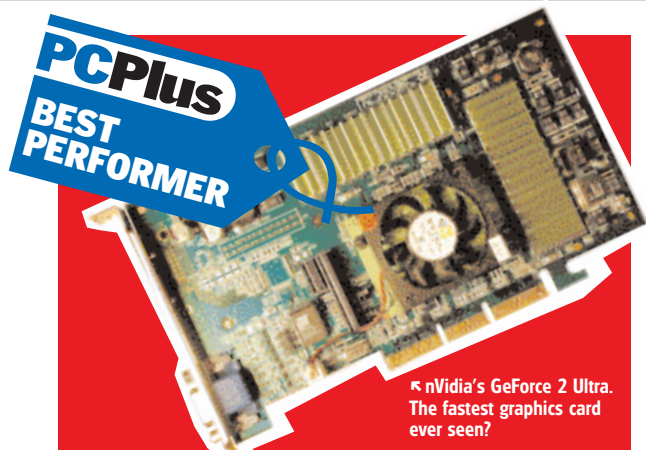
Specifications6

Quality7

Performance6

Value for money6

OVERALL7



κ nVidia's GeForce 2 Ultra. The fastest graphics card ever seen?

GRAPHICS CARD

nVidia GeForce 2 Ultra

PRICE £440 EX VAT £407 SUPPLIER Creative
PHONE 01604 859333 WWW www.nvidia.com & www.3dsl.com

How does nVidia's new graphics card compare with the competition?

I was fortunate enough to get a first look at this latest graphics card from nVidia. It arrived in the UK mid September and as there are only two others in the country, I only had it for a day. Needless to say this gave me a chance to run a few tests on it and just check out some of nVidia's claims.

.....

Tested on
AMD 1100MHz with 256MB memory
Extra information
Expect pricing to fall to £370 quickly

The GPU (Graphics Processing Unit) is capable of running in excess of one billion pixels per second. nVidia claims that this addition makes it several times quicker than any other graphics processor at any price.

Its transformation and lighting engines can render more than 31 million sustained triangles per second enabling features like per-pixel shading. The nVidia Shading Rasterizer (NSR), can now produce single pixel shading giving substantial improvement to colour, light, reflectivity and even dirt. To achieve this sort of performance, nVidia has clocked it at 230MHz, or effectively 460MHz, using the 64MB of DDR memory, and claim an amazing throughput of 736GB per second. When will it ever stop?

A High Definition Video Processor (HDVP) is included to give improved HDTV and DV performance. This is fully compatible with all 18 ATSC formats making ideal as a companion card to a DTV receiver card.

nVidia has continued to use its Unified Driver Architecture (UDA) in other words one driver is suitable for all cards. This is a real bonus when it comes to updating. Not only is it a full compliment of Windows drivers, they also have a Linux driver available at launch.

I tested the card on a rather quick Armari system. This uses a couple of Coppermine processors running at 1GHz on a twin processor board running Windows

2000. Using our standard 3D Mark software it achieved an amazing benchmark of 5,279 in the 800 x 600 x 32-bit test. This is by far the fastest I've come across and with Win2000 not noted for blindingly fast graphics performance, quite exceptional.

We tested a host of 32MB cards two issues ago. In comparison, the extra memory really does make a difference

As most manufacturers are now sticking close to nVidia's reference board, I doubt if there will be much difference in performance between the like of Guillemot, Creative and other manufacturers. However, a bit of competition should help keep the prices down but at the moment nothing much else looks like challenging nVidia for the crown.

Paul Warner

PCPlus Verdict

nVIDIA GEFORCE 2 ULTRA

✓ FOR

→ Nothing to touch it

✗ AGAINST

→ You have to pay for the privilege

Specifications9

Quality9

Performance10

Value for money7

OVERALL8



↑ The Backpack CD-rewriter can do the job, but couldn't they have made it smaller?

CD-RW

Micro Solutions Backpack CD-RW

PRICE £249 **EX VAT** £205 **SUPPLIER** CSM Peripherals
PHONE 020 8960 6000 **ONLINE** www.micro-solutions.com

Would you like to make audio CD's and backup data through the same external drive?

As the information age starts to show itself as the next industrial revolution, data storage is becoming increasingly important. Currently, the most popular equipment includes hard drives fixed in your computer,

.....
Requirements
IBM or compatible
Pentium, high speed
parallel or USB port, Win
9x, 16MB RAM, 10MB
hard disk space per min
of audio to be recorded

peripheral disk drives like Zip and Jaz, or the option of holding your data on a Net-based sever. With so many options available, what can Micro Solutions CD-RW offer the user that other systems can't?

Its strongest point is its flexibility. This device gives the user a choice between connecting with a USB cable or plugging into the parallel port if the computer doesn't have a USB port. This means that the drive can be used in conjunction with a variety of different machines, using the cables it is issued with. The drive does not require an internal card or adaptor, meaning that it's quick and simple to set up. Another advantage is that it has an extra parallel port on the back, allowing you to daisy-chain peripherals to a single parallel port.

The included software is adequate, allowing you to create audio CDs for home entertainment, multimedia CDs for presentations, and data CDs for backup/storage. This is where re-writing is most useful. Re-writable CDs are not suitable for recording/playing music on CD players, but as a data storage medium they are excellent. They can hold over six times the data of a Zip disk, at 650MB, but not as much as the 1GB Jaz drives. This can be put into perspective when you realise that a Jaz disk retails for around £90, whereas you can buy a blank CD for under a fiver. Formatting the CD can be time consuming (around 20 minutes), but is ultimately worth it as it

means you can drag and drop files directly on to the CD through Windows.

So what's wrong with it? Well, it could use some more up to date features, such as burn proofing, as buffer under run occurred at least once during testing. It does not have a CD text function, which is essential to anyone serious about making audio CDs. The unit is also quite large, weighing in at a hefty 4lbs 8oz. The parallel connection offers slightly more stability than the USB connection, but at a greater strain on the CPU.

In conclusion, the Backpack CD-RW is an effective solution to the data storage problem for those operating on a budget, and its flexibility means that it can be made to work with most systems.

Joe Lees

PCPlus Verdict

MICRO SOLUTIONS BACKPACK CD-RW

✓ FOR	✗ AGAINST
→ USB/Parallel interface offers	→ Against
→ Flexibility	→ Not burn proof
→ Cost efficient storage medium	→ No CD text

Specifications	7
Quality	6
Performance	7
Value for money	7
OVERALL	7



↖ The Kyocera FS-1000: Environmentally conscious, easy to use, and stunningly beautiful?

LASER PRINTER

Kyocera FS-1000

PRICE £387 **EX VAT** £319 **SUPPLIER** ISA International plc
PHONE 01274 306787 **ONLINE** www.kyocera.co.uk

Kyocera's printer is designed by FA Porsche, breaking design barriers by making it... square

The FS-100 printer from Japanese electronics giant Kyocera comes stacked with so many options, that it's hard to know where to start. Technically, it comes well equipped with a 75MHz processor and 4MB of RAM, with the option to upgrade to 132MB, for those in a work intensive environment. Its performance is adequate,

.....
Tested on
PIII 500MHz, 128MB
RAM, Win98

with a fifteen second wait for data transfer, and a quoted printing speed of 10 pages per minute. The FS-1000 can be run as either a local printer through a parallel port, or with an interface upgrade as a networked printer.

The software support with this hardware is excellent, including programs for users of all levels. For the office user, there is the remote operation panel, that bypasses the printers folder in the Windows control panel. It allows you to manipulate the settings of the printer, and even has a small 3D graphic that simulates the printer's status, usefully showing you when the top cover is open or when the paper tray is out. Also included on the CD-ROM is Prescribe 2e, a command based language for the printer. Easily accessible through a 853-page manual, this allows you to manipulate fonts and draw objects without using external software. This may not appeal to the entry level users, but would be useful in a scientific application of the printer.

Resolution wise, the 600dpi printouts were all sharp, the printer handling text documents and greyscale images with equal ease. It has an interesting approach to ink storage, opting for a large black ink toner cartridge that offers value for money and consideration of the environment. The cartridge is made from recycled materials, contains no harmful or poisonous substances, and has a life span of 20,000 pages. This

environmentally friendly approach has earned Kyocera a Blue Angel award in Germany, presented by an independent review board.

Operationally, the Porsche design is functional, including a rear access tray to clear paper jams, but none occurred during testing, despite repeated provocation. The paper tray is well laid out, containing a maximum of 250 sheets of A4 paper, with the usual options for envelope and label printing.

The printer does require a clear space on either side and above it, making it unsuitable for most desktops, and at 9.5kg, it is not a lightweight, but if you can stomach the price, this is an efficient, flexible solution to entry level office printing.

Joe Lees

PCPlus Verdict

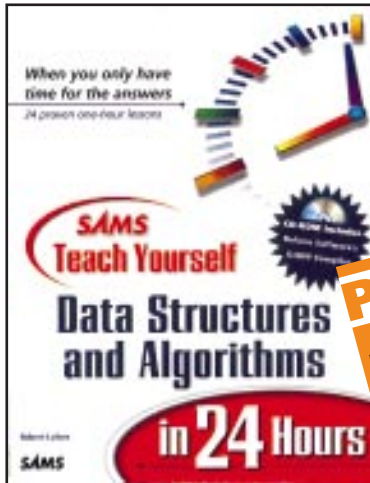
KYOCERA FS-1000

✓ FOR	✗ AGAINST
→ Environmentally friendly solution	→ Cost of unit and upgrades
→ Excellent software support	

Specifications	8
Quality	7
Performance	6
Value for money	6
OVERALL	7

Essential reading

Stimulate your mind with these teach yourself programming books



PRICE £22.49
FORMAT Book/CD
AUTHOR Robert Lafore
PUBLISHER SAMS
ISBN 0-672-31633-1
LEVEL Intermediate

www.sampublishing.com

Teach Yourself Data Structures and Algorithms in 24 Hours

24 hours and you'll know all you need to about programming

Aworthy addition to the familiar SAMS Teach Yourself in 24 Hours series, this book divides its subjects into two dozen sessions, each taking between half an hour and an hour to complete, presented in a hands-on tutorial style. In this case the subject is programming, including problem analysis, so some very skilled computer users may fear they are out beyond their depth during the first few lessons.

However this book makes the going pleasant and instantly rewarding, working on interesting problems without force feeding mathematical equations on the student.

Based around C++, several tiny applications are developed at a steady pace. Some exposure to programming, perhaps even to C++ itself, will make the going easier, but the emphasis is on the problems, and the models erected to solve the problems. (A little C++ compiler is provided, along with all the code in the book, on the CD-ROM.)

A pleasurable trip around the practical

steps of creating queueing theory, insertion sorts, binary trees, graphs and recursion take centre stage through most of the sessions. For example, a little program solving the Towers of Hanoi (moving several graduated discs in an orderly fashion from one place to another, disturbing only one of the discs at a time) serves as the tool by which recursion is studied.

It may be objected that the examples used in the text are none too practical: who among us are likely to find ourselves advising Indian monks how to heft silver discs in an effort to bring creation to an end? But in fact, these exercises stretch our mental muscles and ready us to note similarities with problems that arise in the real world.

It should be pointed out that object oriented programming is not made prominent in this study of data structures and algorithms: that, it would seem, is a subject for another book and another time.

PCPlus Verdict 10/10



www.prima-tech.com

CGI Fast & Easy Web Development

CGI is the 'Common Gateway Interface' - a standard specification that enables Web servers to communicate with programs on other servers. It is not itself a programming language, but a standard architecture that facilitates parts of the Net working together to provide a practical environment. This helpful book aims itself at the gifted amateur - a self starter. Though it professes to deliver competence in CGI programming to the reader, it assumes the reader is already a Web developer: it would be an ideal gift for a computer-literate hobbyist seeking to delve deeper into control of the computer environment.

Large diagrams, including detailed screen depictions, appear throughout the book. It is designed to stay open on the desk where it is placed.

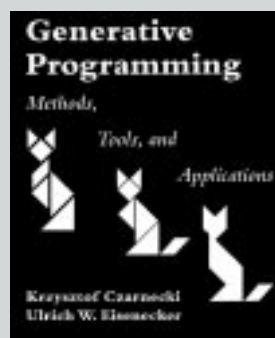
PRICE £18.99
FORMAT Book/CD
AUTHOR Johnnie R. Christenberry et al.
PUBLISHER Prima Tech
ISBN 0-7615-2938-1
LEVEL Beginner

In the first part of the book, practical steps guide the reader through planning Web pages and related data structures, onward through techniques for using pseudo-code, then through an intelligent discussion surrounding the choice of programming language, and culminating in actual coding of a minor application in PERL.

The second part deals more directly with handling data, while the third part goes on to more advanced topics such as file handling, regular expressions, formats and cookies. A final brief session, organised as an appendix, gives some exposure to the world of debugging.

Code in the book is on the CD-ROM, with HTML editor and FTP software.

PCPlus Verdict 8/10



www.awl.com/cseng/

Generative Programming

The authors state their awful case at the outset of this thought-provoking book: software engineering lags nearly a hundred years behind hardware development. Up to now, advances in hardware has made nothing of any concerns about this sorry state - but where necessity forced the early designer to create operating systems within a few kilobytes of memory, today's software developer can afford to use a few megabytes for a clock applet.

This book argues that the time is ripe to change this, because "current software engineering does not meet high expectations concerning high complexity, achieving high productivity and quality, and facilitating effective maintenance and evolution".

The authors actually make the case that object oriented analysis and programming fail to make recycling

PRICE £34.99
FORMAT Book
AUTHOR Krzysztof Czarnecki & Ulrich W. Eisenecker
PUBLISHER Addison-Wesley
ISBN 0-201-30977-7
LEVEL Advanced

and effective re-use of code a realistic objective, where quality and efficiency demand these intents.

The greater part of the book investigates tools and methods already available that move the serious software engineer much closer to realising these objectives, able to gather proven chunks of code and applying them efficiently. The emphasis falls very much on tools that generate source code, as one may guess from the title, but the practicality does not end there. If you read this you will almost certainly find yourself adopting more care in programming, and developing a healthy, efficient style. You may even find yourself in the vanguard of the next computer revolution - one driven, finally, by software considerations.

PCPlus Verdict 8/10

BRIEF ENCOUNTERS

→ The bit where **Joe Lees** gets short and to the point...



AF Clearjet

PRICE £11.51-20.80 **EX VAT** £9.79-£17.70
SUPPLIER Automation Facilities
PHONE 0118 940 4031
ONLINE www.af-net.com

The AF Clearjet is an inkjet print head cleaning cartridge. What this mouthful actually does is replace the ink flowing through the print heads with cleaning solution. According to the online documentation, the time to clean your heads is when you start to get white lines across your printouts, indicating an obstruction in the ink flow system. The sticky nature of ink, combined with dust invasion into the printer can produce such blockages. Simply print out the template provided, a completely black page, with the cleaner cartridge instead of an ink cartridge, and voila, your heads are clean. Prices vary according to printer model.

PCPlus Verdict 6/10



Mirai 27.3 GB hard drive kit

PRICE £105 **EX VAT** £89
SUPPLIER Simply
PHONE 0870 727 2190
ONLINE www.mirai-technologies.com

The new Mirai Hard drives are manufactured by Fujitsu, so aside from the slightly oddly shaped documentation (the manual is about a metre long), it's a pretty good product. The drive contains four platters, with two reader heads to each. With a claimed data transfer rate of 66MB/s, this drive is no slouch, although upon installation the drive registered as being just over 24GB. The drive is not hard to install, the biggest problem is probably the internal architecture of your PC. Once it is in the bay though, you are set. 27GB ranks up there with some of the monster drives available at the moment and, unless you are planning to edit feature length DV movies, it should see you through all right.

PCPlus Verdict 9/10



Ericsson R380

PRICE £299 **EX VAT** £254
SUPPLIER Ericsson
PHONE 01444 234567
ONLINE www.ericsson.co.uk

The R380 is the future of mobile phones, according to Ericsson. This smartphone, with built in PDA functionality, is barely larger than a standard mobile. The basic operating system is EPOC, from Symbian, based on Psion's handheld OS, although the look and feel of the R380's is very different.

Data entry is via the touch sensitive screen, with the choice of handwriting recognition or a soft keyboard. A docking cradle is supplied so you can link up to your PC. Lotus Organiser and Lotus Notes are supported at present, with Organiser 5 supplied in the box.

The price compares well with smaller PDAs but there are a few small potential hitches. At just 1.2MB, the internal memory isn't exactly huge. Nonetheless, it's a mightily impressive piece of kit.

PCPlus Verdict 10/10



Sanyo LMU-TF181A1

PRICE £2936 **EX VAT** £2499
SUPPLIER Sanyo
PHONE 01923 477220
ONLINE www.sanyo.co.uk

TFT (Thin Film Transistor) screens are becoming increasingly commonplace at the moment, but not many come as well equipped as the Sanyo LMU-TF181A1. After an extremely frustrating five minutes of frantic searching for the DC-in port, I found it located behind the back panel, with two USB ports nestling beneath it.

This ingenious design means that although the monitor can be plugged into five USB devices, the cable clutter can be kept down by bunching the cables together.

At 18.1", this monitor is absolutely enormous, and it offers a very reasonable quality picture. Being a plug-and-play device, it is very easy to use, and it will be difficult to find one that matches. All in all, a quality monitor which gave a reasonable performance.

PCPlus Verdict 8/10



→ Tiny Media Book Extreme

PRICE inc. delivery £2036 **EX VAT** £1699
SUPPLIER Tiny **PHONE** 0870 1656611 **BUY ONLINE** www.tiny.com

Notebooks, laptops, whatever you want to call them, you cannot deny that they get better every day. Tiny's latest offering is no exception, with a PIII 933MHz processor, 184MB of RAM and an ample 18GB hard drive. This monster spec amply qualifies it for almost any multimedia tasks, aided and abetted by the built in DVD drive. It's hard to believe how many features Tiny have put into this, er, tiny footprint - built in stereo speakers, IR port, PCMCIA card slots, two mini USB ports, TV port, the list goes on. It's small, it's fast, it has a nice big screen. What more could you want? (Answers to the usual address...)

PCPlus Verdict 8/10



→ Samsung SyncMaster 170MP

PRICE £2137 **EX VAT** £1819 **SUPPLIER** Samsung
PHONE 0800 521652 **ONLINE** www.samsung.co.uk

If you can overlook the cheesy spray-on chrome paint that covers this TFT monitor, then you'll find a few good features. It has inputs for standard PC interface, video or DVD players, and television antenna. It features an onboard tuner, so it can be used for a variety of viewing experiences. It also features the ability to overlay a television signal in a small borderless window over your PC signal, called Picture-in-Picture or PIP, allowing you to type documents and watch the footie at the same time. With the correct attachments it can be wall or arm mounted, for that cyber-furnished look.

The layout of the menu and buttons is intuitive, and although the remote suffers from lashings of chrome paint, it's useful for manipulating the PIP window without getting off the sofa. With static pictures, the image quality is awesome, but when I tried to run Unreal, there were some ghosting images. On the whole though, the images were sharp and clear. This monitor is functional, with enough extras to make it worth a second look. Hung on a wall, used in conjunction with an IR mouse and keyboard, whilst overlaying a television signal, it would look slick.

PCPlus Verdict 8/10

Fujifilm FinePix 40i

PRICE £499 **EX VAT** £412
SUPPLIER Jessops
PHONE 0800 652 6400
ONLINE www.fujifilm.co.uk

Yes! This is what technology is supposed to be like. Small, shiny automated moving bits, multiple functions and more integrated technology than the bionic man. The first thing that strikes you about the FinePix 40i is the size of it, properly pocket sized, not to the extent that carrying it in your jeans is accompanied by a strange waddle. The fact that something so small can be used to take pictures and short segments of video and to listen to MP3's, reflects the progression of high technology in recent years.

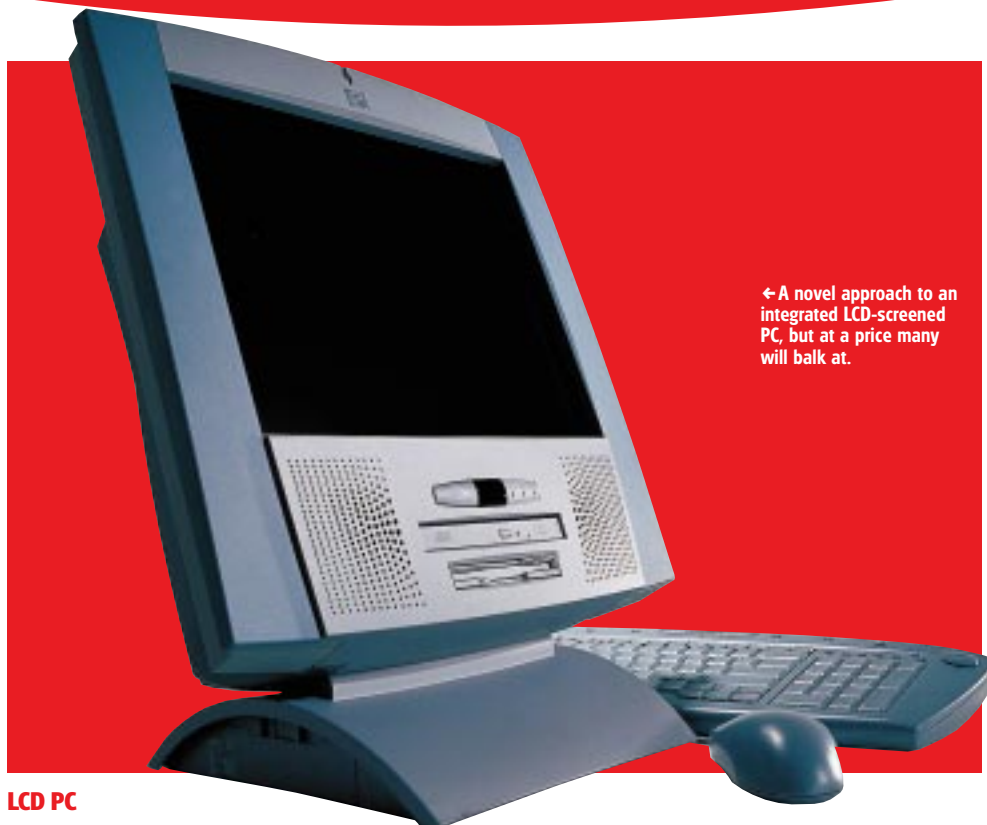
The Smart Media storage disks range from 4MB up to 64MB, and are the key to the camera's flexibility. The USB interface is entirely adequate to handle data transfer from your computer to the camera, uploading the images you have shot and downloading your MP3. The LCD monitor on the back is exceptionally useful, especially when combined with digital zoom.

The menu system is easy to use, allowing you to manage your data from the camera alone. It can be plugged directly into a monitor, stereo, digital printer or floppy disk adapter, and it comes with a thread for a tripod.

The only problem with this camera, as far as I can tell is that, erm, there isn't one.

PCPlus Verdict 10/10





← A novel approach to an integrated LCD-screened PC, but at a price many will balk at.

LCD PC

Evesham Evolve

PRICE £1,996 **EX VAT** £1,699 **SUPPLIER** Evesham.com
PHONE 0800 038 0800 **ONLINE** www.evesham.com

Evesham looks to the Evolve as a style leader, with its all-in-one approach, but there's a price to pay

A lot of new designs for PCs are emerging and the integrated PC with an LCD panel is a favourite. Evesham's take on this is the Tatung-made Evolve. The two-tone grey case houses a well-specified desktop PC with innovative and stylish design, taking up very little desk space.

The front face of the Evolve is mainly devoted to a 15.1-inch flat panel screen, as large as any you'll find on a notebook and closer to a 17-inch than a 15-inch CRT diagonal. It's a good quality TFT display with high contrast and a good viewing angle in the horizontal plane, though less so vertically.

Under the screen are a four-speed Hitachi DVD drive and a 3.5-inch floppy drive, both notebook-style devices. Twin speakers set into the fascia, either side of the drives, give only fair sound, with most of the bass frequencies forsaken for the look of the machine. Finally at the front

Specifications

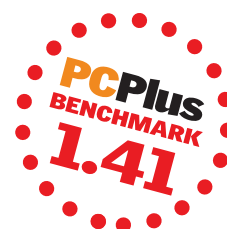
Processor: 700MHz Pentium III, RAM: 128MB (512MB max), Drives: 18.9Gb Samsung hard drive, Hitachi 4x DVD, floppy, Video: S3 Savage 4, 8MB, Display: LCD panel, 15.1-inch, Expansion: 4 USB, 1 x 9 pin serial, parallel, 10/100BaseT Ethernet, TV, 2 x PC Card
Other hardware V90 WinModem, integral speakers (small)
Operating system Windows 98 SE
Software GoBack, DVD/modem/sound utils

are power and hard drive indicators, an on-off switch and an infra-red link to the keyboard.

The keyboard is one of the most interesting aspects of the Evolve. It's cableless and also multimedia, with extra buttons for Internet and CD transport functions. That's not the end of its functionality, though: it has twin pads that fall under your thumbs if you hold it on your lap. The left one simulates left and right mouse buttons and the right acts as a pointer controller. There's a regular, cable-fed, USB mouse too, for when you're working at a desk.

Talking of USB, the Evolve has four ports, so there are three free for peripherals. It's very well endowed with connections of all sorts, as there are serial and parallel connectors, as well as one for external TV and another for a 10/100BaseT Ethernet network. Finally, there are two PC Card slots, so you can easily transfer data from a notebook or feed the machine with pictures from SmartMedia or CompactFlash cards through adaptors.

Evesham has based its machine around a 700MHz Pentium III processor with 128MB of memory and an 18.9GB hard drive, so it should be no slouch. There are no expansion slots though and the graphics adaptor is a Savage 4 chip from S3, which is again more notebook than desktop technology.



The performance that the machine produced was fair on SYSmark 2000, but dipped noticeably on the 3DMark 2000 test at 800x600 pixels and refused to complete the run at the higher 1,024x768. The Video 2000 score was above average, but didn't excel.

Against all this versatility are a few shortcomings. The weight of the system unit is a bit too much for the hinge holding it to the base – touch it and it sways back and forward. The Evolve takes a long time to start up too, and any changes of screen mode involve a lengthy process with lots of screen flashing as the machine establishes the new settings. Last, we had trouble waking the Evolve once it had gone into a full standby – we had to restart on a couple of occasions.

All in all, this is a good desktop PC for somebody who wants something different and is prepared to pay for it. And that's the rub, really. A conventional PC with similar specification would cost under £1,000 and not all of that difference can be accounted for by the price of the LCD panel. While the Evolve is probably an example of where PC design is going, we have to hope it's not also an example of the destination of PC prices.

Simon Williams

PC Plus Verdict

EVESHAM EVOLVE

- | | |
|-----------------------------|----------------------------------|
| ✓ FOR | ✗ AGAINST |
| → Integrated design | → Slow start up and mode changes |
| → Clear, bright LCD panel | → Sometimes it wouldn't wake up |
| → Novel multimedia keyboard | → Wobbly hinge |

Specification8
Quality7
Performance8
Value for money5

OVERALL7

→ Performance results

PC Plus Index	141
BapCo Internet Content	137
BapCo Office Productivity	132
3DMark 800 x 600 x 32-bit	1,090
3DMark 1,024 x 768 x 16-bit	Wouldn't complete
Video 2000	2,306

Free Web Hosting

Get your own Web estates for free and start building that perfect site you've always dreamed of

These days everyone wants their own patch in cyberspace. Many people are happy with what they get from their ISP, but not everyone has the opportunity. To fill that gap, there are many providers out there who give you some Web real-estate for free. This isn't a new phenomenon, as there have been free web hosts for years (back when it wasn't standard for ISPs to give you some space,) but in today's market there are a lot of companies competing for your attention.

They all offer varying 'deals' and so the prospective tenant has to be careful where they starting building. Features are everything in this arena so when we examined four of the most popular hosts, we looked carefully at what was offered. We were particularly interested in how the user could access their space, the quantity available and extras such as CGI scripts, and of course those pesky advertising banners.



← Fortune City UK offers 100MB of free space to build your own site.

www.fortunecity.co.uk

Fortune City UK

Build a site from scratch with the help of a free Web host

Fortunecity.com was established back in 1996, and its younger sibling on test here appeared on the scene in mid-1999. The experience of the elder site is reflected here, resulting in a slick operation. The site is extensively themed and strong emphasis is placed on the community aspect of Fortune City life. You must choose a 'district' for your site during the simple sign-up process, so it is wise to know what your subject will be before signing up.

The features on offer here are reasonably impressive. The space allocation is a very generous 100MB which should be enough room for anyone who isn't prepared to pay for full hosting. Access to your space is via FTP or through

Web-pages, which makes the system quite flexible. Of course, not everyone who wants to build a Web site knows how to do so. As with most of the other sites on test there is a homepage builder provided by Fortune City, allowing the user to build pages the quick and easy way.

For security reasons users are not allowed to upload their own custom CGI scripts, but they do provide a number of scripts which you can utilise with your new site, including a counter, form-mail and a guestbook. Like almost all free hosting services Fortune City helps finance itself through the insertion of advertising banners into your pages. While many see this as a necessary evil, like NBCi, Fortune City's banners invade your pages quite a bit, so don't count on it complementing your designs.

Fortune City is a great place to host your site – the connection speeds are good, the help facilities are comprehensive and the community aspect complements the respectable features.

PCPlus Verdict 9/10



← Tripod UK and Ireland allows access to counter, form-mail and guestbook, but if you want to use more than the 12MB of the 100MB that they offer, you will need permission.

www.tripod.co.uk

Tripod UK and Ireland

Tripod offers a similar set of features to Fortune City, but do so with less style. 100MB of space is offered (although if you intend to use any more than 12MB you must request permission.) Again, no custom CGIs are permitted, but you do get access to a counter, form-mail and guestbook. Access to your space is via FTP and Web browser, and Tripod also supply an online homepage builder for newcomers.

Tripod offers a community feel through its Pods but it doesn't feel as natural as Fortune City. The banner system is probably the least intrusive – code is inserted into every page which spawns a new window containing an advert. Pages load quickly, and they have lots of help material, but, in my opinion, Fortune City has the edge.

PCPlus Verdict 8/10



← The American Web space site, NBCi, has a cluttered sign-up site making it a difficult task to access your own site, however, you are given unlimited disk space - if you can sign in.

<http://home.nbc.com>

NBCi

Xoom is a longstanding participant in the free Web-space market, and has recently been rolled into the American portal site NBCi. The main site is quite cluttered and it's hard to spot where you actually sign up for space. Signing up is for the portal in general, so you get plenty for the effort. Once signed up it becomes apparent that this offering is nowhere near as polished as the rest when it comes to Web space.

Frame are used to put a banners

into your pages and are more hassle than some of the other techniques. The usual FTP and browser upload methods are available, as is the customary online page builder. A counter and guestbook are the only scripts available. Disk space is unlimited but with meagre facilities and occasional poor download speeds, there's not much to entice users.

PCPlus Verdict 4/10



← One of the oldest free hosting sites, Geocities, enables access to all of Yahoo's services. But this site has a limited disk space of only 15MB, so there will also be limitations on the quality of your site.

<http://geocities.yahoo.com/home/>

Geocities

Geocities is another veteran of the free hosting scene. It was recently sucked into Yahoo and so sign up for Geocities is actually for all of Yahoo!'s services (including auctions and e-mail.) Access to Web-space is via FTP, Web Browser, wizards and a homepage builder. Geocities has a tradition of being community based and the communities have their own representatives and 'community workers' who are willing to help with problems.

Again, no custom CGIs are allowed, but they do have the best range of scripts available for use. Banner ads come in the form of a floating window which appears within your browser which is tolerable. For the most part Geocities provides a good list of features but a small space allocation (15MB) and a heavily loaded service are held against it.

PCPlus Verdict 7/10



GRAPHICS TOOLS

Visual GIF Animator Matchware

PRICE £58 **EX VAT** £49 **SUPPLIER** Matchware Ltd
PHONE 0181 940 9700 **BUY ONLINE** www.matchware.net

Matchware's new GIF animator lets you bash out banners and buttons in minutes

This is the latest addition in a long line of development tools designed for Internet use, but differentiates itself from the rest of the pack by focusing on a few main areas. Its primary function is to enable the user to build banners for their

Requirements

486 or better, 16MB of RAM, Windows 9x, VGA display, CD-ROM, mouse
Tested on
PIII 500MHz, 128MB RAM, Windows 98

Web sites with the minimum amount of fuss and effort. This is achieved in two main ways. First, the documentation, both in a manual and on CD-ROM, is clear and concise, with a quick start section that will enable novice users to appreciate the capabilities of the package in a short time. By talking the user through the basic design of an advertising banner, they are made aware of the functions of the tools and the range of effects available. Second, the on-screen layout of the tools has been well planned, focusing around one main tool bar and the time line. The inclusion of the time line means that the animations you

create can be as complex as you are willing to make them. Anybody who has used Mediator will be familiar with most of tools available here.

Aside from banners, the program is also equipped to design buttons, and fully-fledged GIF or AVI animations. The button creation process can either be based on a library of preset images, or created from scratch by the user. The library files are useful for gaining an idea of what the program can actually do, but by no means restrict the user to a system of presets. The library contains standard GIFs, as well as a wide range of transitions that can be applied to any object in the program. These range from simple fade ins to explosive transitions that disintegrate your text and send it flying over the screen.

The animation function is intuitive, simply requiring the placing of points on the screen, and then tying the path you've set out to the object you want to manipulate. It is possible to animate buttons, effects like bump maps and to tie several objects to a single animation path. A checking facility has been included to highlight any errors in your application.

On the downside, the window interface in the program can be annoying if you are dealing with a large number of objects, as you have to keep switching between the time line and the preview window. Also, experienced animators might find this package limiting because of its simplicity, but then it is designed for Web banners.

Joe Lees

PCPlus Verdict

VISUAL GIF ANIMATOR MATCHWARE

✓ FOR

- Simple to use
- Export to AVI or GIF
- Library of good effects

✗ AGAINST

- On screen layout could be better

Specification	8
Quality	8
Performance	7
Value for money	6
OVERALL	8



WEB SITE METER

Web Site Traffic Meter Web Master Version

PRICE £136 **EX VAT** £160 **SUPPLIER** Guildsoft **DEVELOPER** Intelliquis International **ONLINE** www.intelliquis.com

Discover how other people use your Web site with this valuable tool

When you've created your Web pièce de résistance, it can be invaluable to see your site from a user's point of view. What you need is software that enables you to see how people use your site so that you

System requirements

Pentium 150, Win95/98/NT/2000, 32MB RAM, 15MB hard drive space, TCP/IP Net connection, Web site, Access to Web server log files

can more effectively guide them to the bits you want them to see, or optimise the bits they do see. That's exactly what Web Site Traffic Meter does.

The program uses Web server logs that your ISP generates, and you may need to set up a special Web directory in order to receive this log file. You may even be charged significantly more to access them. Furthermore, the files can quickly become

← Web Site Traffic Meter is a must-have tool for any serious Web manager, but there's still room for improvement.

large, so those of you with limited Web space may not want to allow them to grow to any great size. Once you've pointed the program at your Web log, it performs an analysis then generates a report. This report provides a massive amount of information, ranging from who has visited your site, to what pages they prematurely aborted.

The report opens with a page of statistics that details the number of hits per day, the number of return visits, the number of unique IP addresses and the amount of data transferred.

From there on, you can choose to analyse your site traffic in more detail. The most useful sections are the Most Requested Pages and the Most Requested Files logs. In a short time, these enable you to work out what bits of your site attract the most attention, so that you can make other parts more appealing, or increase the value of the bits that people do visit.

Another valuable section for me as an imperfect Web designer is the Error log. This immediately reveals a number of possible problems such as missing files, incorrectly named files, aborted downloads due to excessively large amounts of content and a number of other potential problem areas.

Web Site Traffic Meter's effectiveness can be greatly restricted by the amount of detail that your ISP stores in its log files, but with a comprehensive log file you can even discover how people found out about your site and the path they took to reach you.

It's a real boon for site managers who want their sites to work smarter and harder.
Mat Broomfield

PCPlus Verdict

WEB SITE TRAFFIC METER WEB MASTER VERSION

✓ FOR

- Provides analysis of your Web site traffic
- Enables you to optimise your site design

✗ AGAINST

- Dependant upon the amount of data provided by your ISP
- Poor export options with slow Word document generation

Specification	8
Quality	9
Performance	9
Value for money	7
OVERALL	8

It has been a while since we have seen a new hardware partner working with Microsoft on its hand-held operating systems. In the beginning there was a whole slew of them including Philips, Sharp, and LG, but slowly they fell by the wayside, to leave the palm-sized arena dominated by Casio, Compaq and Hewlett-Packard, with Symbol also active as far as specialised corporate applications are concerned. It might seem odd, then, to see a new entrant in the form of PC manufacturer Hi-Grade. But the Hi-Pad 131 is, in fact, a unit made by Palmax. Rebadging is not uncommon in computer hardware circles, and this is not in itself a negative point against Hi-Grade. In fact, it is a positive one. Palmax has never sold its palm-sized computers direct into the UK, and their arrival via Hi-Grade can only push the market forward.

So, now you know the background, let's take a look at the unit itself. The first thing to note is design and build quality. With Hewlett-Packard, Casio and Compaq all going for something stylish and different this time around, it is interesting that the Hi-Pad 131 takes a more traditional approach. The unit is a brushed silver in colour, a standard tablet shape, albeit with rounded rather than squared off corners.

There are four application shortcut buttons on the front, pointing to the built in Calendar, To Do List, Contact Manager and Notes. On the left side of the case is a slew of additional buttons and connectors comprising of the power switch, a rocker switch for scrolling and selection, a button which calls up the Start Menu, a shortcut to the voice recorder, a backlight toggle, headphones jack and the DC in jack.

Overall, this is reminiscent of the construction of the previous generation of Windows CE keyboardless machines, rather than of the trend-setters of the Pocket PC era. In not being hugely innovative it may dissuade those who want a stylish and different looking hand-held from considering it as a purchase. But the less fashion conscious may be please to learn that I have no great criticisms of the design of the Hi-Pad 131 or of its build quality.

On the software side, all the standard Pocket PC fare is included – see the product specifications for details. Hi-Grade has not, however, gone overboard with extras. The ROM contains no extras at all, and the Bonus Software CD includes a long list of third party applications and links to the Web sites from which to obtain them but little else.

Hi-Grade does include a second CD which provides a copy of ActiveSync version 3.1 for improved data sharing with a PC, drivers for a digital stills camera (this will be an optional extra capable, I understand, of taking 24-bit images at 640 x 480 pixels), and a handy little utility called Port2Land, which enables you to switch the display from its standard portrait appearance to



→ The Hi-Pad 131 from Hi-Grade is a solid and serviceable pocket-sized computer.

HAND-HELD PC

Hi-Grade Hi-Pad 131

PRICE £399 **EX VAT** £339 **SUPPLIER** Hi-Grade **PHONE** 0208 532 6508 **ONLINE** www.higrade.com

Hi-Grade's new Pocket PC hand-held computer is the company's first foray into this market

Specifications

MIPS processor running at 131MHz, 32MB RAM, 65,536 colour display (240 x 320 pixels), lithium ion battery with quoted life of 75 hours, infra-red port, 1 x CompactFlash card slot, built in microphone for voice recording

Other information

Pocket PC is supplied with Calendar, Inbox, Contacts, Notes, Pocket Excel, Pocket Word, Tasks, Microsoft Pocket Internet Explorer, Microsoft Money, Microsoft Windows Media Player for Pocket PC, Microsoft Reader. Desktop software includes ActiveSync. Hi-Grade software includes Active Sync 3.1 (for data sharing with a PC), Port2Land (for switching between portrait and landscape display orientation), Digital Still Camera Driver (the camera itself is an extra. Additional hardware includes docking station

Landscape. These are installed in RAM and are provided on CD so that they can be removed and then reinstalled at a later date if required. The display orientation changer Port2Land is particularly nice, and may come into its own if you get into Web surfing or indeed e-book reading, as it stretches the display to the full width available in landscape view. It will also, quite probably, be handy for playing certain types of game. Note, though, that when used this software resets the system – so if you start your application and then decide to change display orientation, be prepared to start it again.

The Hi-Pad 131 is powered by an NEC MIPS processor running at 131 MHz. This is not as fast as some, but is perfectly adequate, and the 32MB of RAM matches the best of the other Pocket PC machines around at the moment. The display runs to 64,000 colours, there is a single Compact Flash slot in the top of the case for adding yet more memory or hardware solutions such as a modem. Power is supplied by a rechargeable lithium ion cell, which, Hi-Grade says should last for around 75 hours. This is about the average for Pocket PC machines. PC connectivity is via a supplied serial cable docking station.

All in all, the Hi-Pad 131 is an average rather than an outstanding Pocket PC machine. Its design is solid but not overly adventurous, and the lack of third party software makes it stand out from the crowd. Hi-Grade has not come in at a competitive price – and perhaps they would do well to consider presenting the Hi-Pad as a more cost effective option than the competition – or increasing the software bundle. But it is good to see the top three players finally getting some competition, much needed.

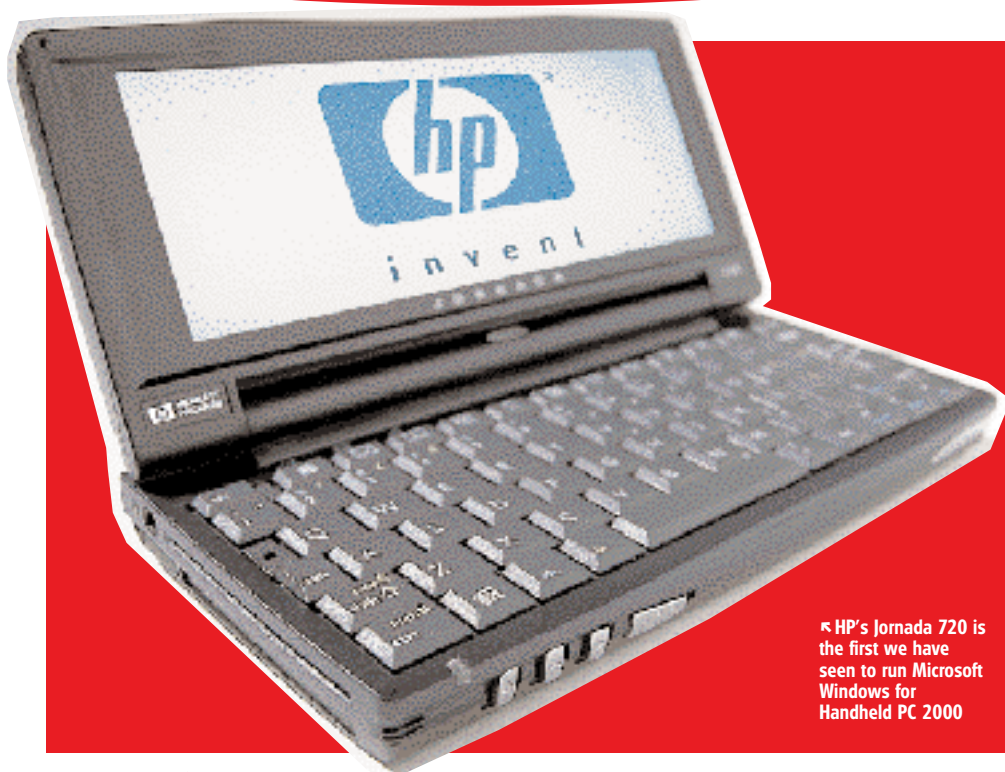
Sandra Vogel

PCPlus Verdict

HI GRADE HI-PAD 131

✓ FOR	✗ AGAINST
→ Solid build	→ Little additional software
→ Nice landscape display orientation	→ Lacking in unique features

Specifications	7
Quality	7
Performance	7
Value for money	7
OVERALL	7



HANDHELD PC

Hewlett Packard Jornada 720

PRICE £760 **EX VAT** £655 **SUPPLIER** Hewlett Packard **PHONE** 0990 474747 **WWW** www.hp.com

Hewlett Packard is first off the handheld mark again, this time with the Jornada 720 running Windows for Handheld PC 2000

The Hewlett Packard Jornada with a keyboard was last looked at back in issue 153 (July 1999). That was their 680, which was replaced by the 690

in due course – a machine essentially the same but running a later version of Windows CE and with more memory. With the 720, Hewlett Packard has again stuck with a basic design that has done them proud, but again has upgraded both the machine's general specs, and the version of CE it runs. The 690 will disappear from the range in due course.

The Jornada 720 is inspired by the latest version of CE. Now renamed Microsoft Windows for Handheld PC 2000, this is different to Pocket PC – which appears in keyboardless devices. It was officially announced in September this year, and Hewlett Packard is first to market with the OS in a device.

Most of the applications that come with Windows for Handheld PC 2000 have been seen before, though there has been some updating. Most notably Pocket Internet Explorer version 4.01 now has embedded support for HTML 4.0 Jscript, and animated gifs. The key new

Specifications

StrongARM SA1110 processor running at 206MHz, 32Mb RAM, 65,536 colour display (640 x 240 pixels), lithium ion battery with quoted life of 9 hours, infra red port, 1 x Compact Flash card slot, 1 x PC Card Type II slot, 1 x Smart Card reader slot, built in microphone for voice recording.

Other information

Windows for Handheld PC 2000 is supplied with Pocket Word, Excel, Power Point, Internet Explorer, Windows Media Player, Microsoft Voice Recorder. HP Software on ROM includes HP Jornada Viewer, Settings, Backup. Third party software - Yahoo! Messenger. Built in modem.

application is Windows media player. This has already been seen in Pocket PC, and it does the same job here - it plays MP3 and WMA files. HP obviously thinks this is an application worth pushing: it has been given one of the four hard icons that sit in a column on the right of the display, and outputs in stereo to headphones. I'm not sure why versions of Microsoft Reader or Money, both of which appear on Pocket PC are not here – but that is Microsoft's failing, not Hewlett Packard's.

Hewlett Packard provides a strong range of tools of their own on ROM. Viewer integrates information from the diary, address book and to do lists. Settings provides quick access to system features such as volume and display adjustments. Backup facilitates quick and easy backup to internal space or external media. HotKeys lets you assign your own applications to the 12 programme keys on the keyboard and to the four hard icons. QuickPad is a note taking tool that supplements Pocket Word, DialUp provides easy internet configuration. There are also a couple of third party applications, LandWare's OmniSolve calculator and Yahoo! Messenger.

Hardware-wise the Jornada 720 is powered by a StrongARM SA1110 processor. The move away from Hitachi's SH3 processors previously favoured by Hewlett Packard has been made in part to help stretch battery life which HP claims has been upped from 8 to 9 hours. There is 32MB of memory, which as usual you can designate as available either for applications or to run programmes using a slide bar accessed through the control panel. There is a built in modem and connection to your PC is either via a cradle, which supports both Serial and USB, or through a connector on the 720 itself.

The 680 and 690 both had slots for Compact Flash and PC Cards. The 720 retains these where previously they were combined into a single slot with a mechanical 'pop-out' system. The difference is, they have now been separated. My own Jornada 690 has weathered use of the integrated slots well, but the 'concertina' system is not easy to get to grips with. Now, the Compact Flash slot is on the bottom of the device and the PC Card on the left. This makes sense, as the CF slot is most likely to be used to add memory, while the PC Card could be used for a range of add-ons including a VGA out adaptor.

There is an additional third slot for a Smart Card which sits above the PC Card slot. This can be used to provide added security, though there is no reason why companies deploying the Jornada 720 in volume should not consider adding more functionality using this.

I mentioned at the very beginning of this review that HP has not changed the core design of the Jornada in this new version. The 720 is the same size as the 690 and 680 – 89mm x 95mm x 34mm, the main visible difference is that the purple casing of the earlier machines has been ditched in favour of dark blue. The display remains as light as before, and the keyboard is a joy to use. It's not quite large enough for full scale touch-typing, but can get up to a fair old speed with it.

It's a pity that Hewlett Packard are phasing out the 690. The 720 is a decidedly corporate device, and is expensive. There's a strong argument for retaining the 690 and pitching it at a more consumer level.

Sandra Vogel

PCPlus Verdict

HEWLETT PACKARD JORNADA 720

✓ FOR

- Solid build
- Excellent keyboard
- 3 expansion ports

✗ AGAINST

- Price
- Not a major OS upgrade

Specifications	8
Quality	9
Performance	9
Value for money	8

OVERALL9



WEB BROWSER

Opera for EPOC

PRICE \$39 SUPPLIER Opera ONLINE www.opera.com

Opera takes up where Psion's Web browser leaves off. It looks like a viable replacement

PSION has developed its own Web browser for EPOC, and distributes this as a user install option on the CD-ROMs it ships with new devices. But the company is so impressed with Opera, that it intends to offer it as a free download for users of the Netbook and Series 7, from www.pSION.com/enterprise. It is also possible they may offer it as a

Requirements
Any EPOC hand-held, modem for Internet connection. Tested on Psion Series 7

free download for other EPOC hardware. But, remember to check the Psion Web site before parting with your money. This is a sure sign that Psion is not intending to develop its own Web browser any further.

Small but perfectly formed

Psion is right to be impressed with Opera. The EPOC version, like the desktop one

← Opera can get Web pages with or without graphics, the latter option leaving text intact but making for faster downloads.

which appeared before it, deserves to be highly praised. (There are also, incidentally, betas for other platforms such as BeOS and Linux). The reasons for the praise are essentially that Opera is both small and fully functioning. It occupies around 2MB of RAM on an EPOC device – enough even for the 8MB Revo to cope with it – and yet has a wide range of features.

Support for frames, zooming in and out of Web pages, bookmarks, and even the ability to open multiple Web pages are among Opera's feature set. It also supports SSL and 128-bit data encryption. Those of us screaming out for e-commerce and secure data sharing from an EPOC hand-held need look for this no further.

EPOC devices do not come with built-in modems, and many users may still be making do with older, slower, modems for their Internet connectivity. So, I am

pleased that Opera offers a range of 'go faster' features. You can instruct it not to download images and to disable scripting languages and frames if speed is more important to you than looks.

With RAM at as much of a premium as disk space on many EPOC devices, the ability to instruct separately whether to cache documents, images or other features in RAM and on disk and to get the caches emptied when Opera exits is a real boon.

The trial of Opera, with a Psion Series 7 and Psion Connect's 56K infra-red Travel Modem, was entirely positive. In fact, the one and only crash came when I was using Psion's own Web browser as a comparison.

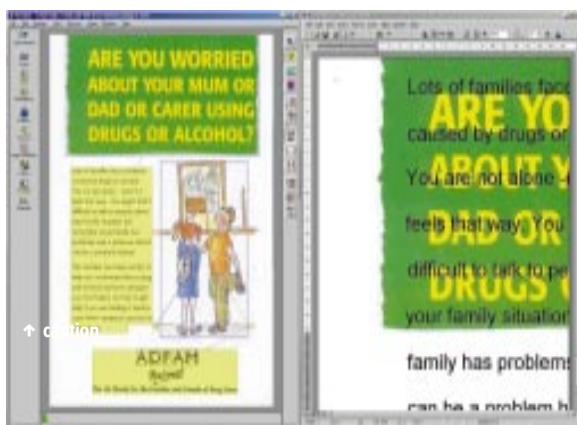
Sandra Vogel

PC Plus Verdict

VERDICT HEAD

✓ FOR	✗ AGAINST
→ Small	→ Currently expensive, though Psion may make it available for free
→ Well featured	
→ Lots of 'go faster' configurations	

Specifications	9
Quality	8
Value for money	7
Performance	9
OVERALL	8



UTILITY

ReadIris Pro 6.0

PRICE £97 EX VAT £81 DEVELOPER I.R.I.S. SUPPLIER Expansys
PHONE 0870 6010141 BUY ONLINE www.irislink.com

Wouldn't it be nice to scan any document and turn it into a computer editable file?

That's exactly what ReadIris 6.0 claims to do. To quote its own packaging, "All my documents automatically read." It's about time, too, and if only it were true, it would be even better.

I.R.I.S makes a number of interesting claims for this program, but the most important is the ability to recognise text in

Requirements
Pentium, Win95 or higher, 32MB RAM, 35MB hard drive space, supported scanner

56 languages including Greek, Cyrillic and simple Chinese, the ability to recognise coloured text, fast recognition speed and document reconstruction.

It may well be able to recognise characters in foreign languages, but considering the fact that the English language manuals demonstrate such a poor grasp of the language, it doesn't inspire much confidence in the program's ability to recognise other languages.

← ReadIris recognised our test document fine but look at the way it 'reconstructed' it in Word format

Unfortunately, the proofing process is really laborious because it shows you suspect areas of the scan in

total isolation, making it impossible at times to work out where in a document they come from. If it at least did context-sensitive spell checking, it would eliminate many of these errors. To worsen the situation, it has great problems recognising large point sizes or italics. This is ironic because it can manage exotic fonts, faxes and even dot-matrix printer output, all of which are quite challenging.

When it comes to reconstructing pages, complete with all graphics and tables, it fails woefully, just outputting a jumble of characters on top of any pictures in Word format. It doesn't even attempt to reconstruct when saving as HTML, which is something that its rivals have mastered.

As for fast recognition speed, that's virtually irrelevant when the recognition process is so tedious, but to be fair, it does have the ability to learn both new characters and entire fonts to reduce errors when you encounter those characters again.

ReadIris 6.0 promises so much that would be useful and delivers so little. Its multi-language support is its only saving grace.

Mat Broomfield

PC Plus Verdict

READIRIS PRO 6.0

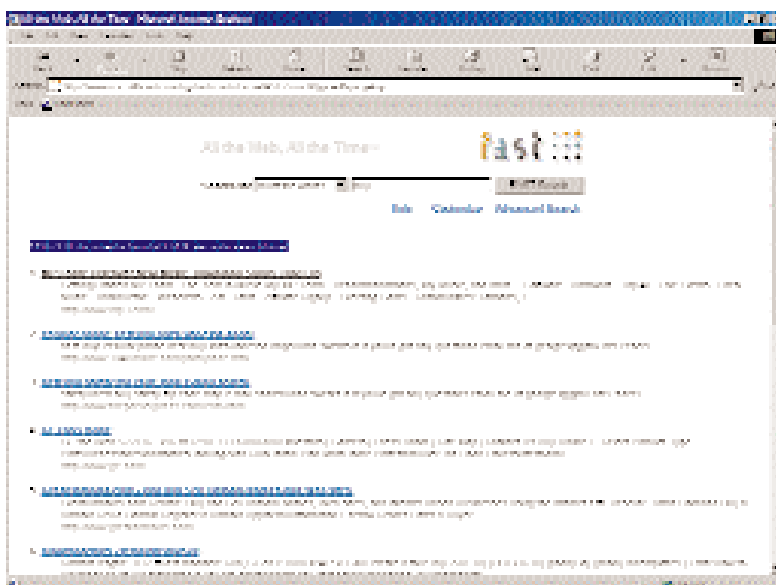
✓ FOR	✗ AGAINST
→ Recognises 56 languages	→ No repeat save option after a document has been exported
→ Learning capability	→ Screws up Word output for fully reconstructed pages
→ Good multi-font recognition accuracy at regular point sizes	→ No HTML reconstruction
→ Clear interface design	→ Poor proofing design
	→ Doesn't like large point sizes
	→ No UK tech support

Specifications	5
Quality	4
Value for money	5
Performance	6
OVERALL	5

Search engines

Joe Lees takes the pain out of surfing with a guide to the best search engines

Search engines are an integral part of the Net, having had to develop in sophistication as the Internet has grown. If you were to draw a map of every computer or storage system linked to the Internet, the resulting diagram would be of a similar complexity to the human brain. A search engine's function is to take information given to it by the user, and then to find and display a list of Web sites that contain data relevant to the information it received. Many search engines work by having a large database of Web sites, but this is not the only way.



www.uscc.alltheweb.com

Fast

Searching the Web can be a tedious job, but with the help of Fast, finding that site can be done in seconds

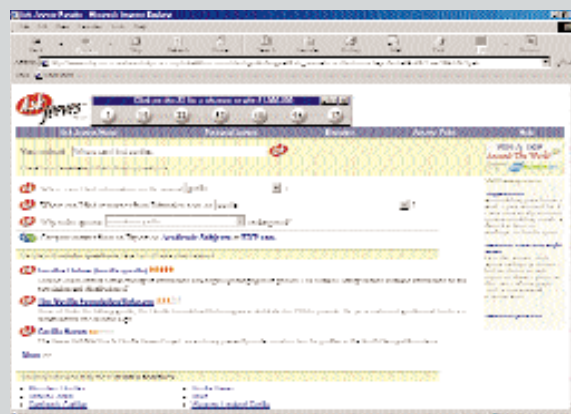
Fast is an acronym for Fast Search And Transfer, and this engine can really do that. To say that it is quite quick would be a gross understatement. For example, on a single word query, the engine returned 4,696,100 hits, in eighteen hundredths of a second. If that's not fast, I don't know what is.

The advanced search option is well laid out and easy to use, offering a language filter, a word filter, and a domain filter. These enable you to include or exclude the data filtered, for example by using the domain filter to exclude any government based Web sites.

The site also includes the facility to search for WAP sites, with some 400,000 documents currently available for viewing.

This embrace of both wired and wireless technologies should see it remain a key player for the foreseeable future. It also offer an MP3 searching service, as well as their own format for video compression. The results of your search are not marked for relevance, but simply displayed over a number of pages, and the numbers of results returned can oscillate from the tens of millions down to single figures. In summary, this engine is incredibly quick, but can return some strange results at times. If speed is your major consideration in a search engine, then check out Fast – it does exactly what it says on the banner.

PCPlus Verdict 8/10



www.askjeeves.com

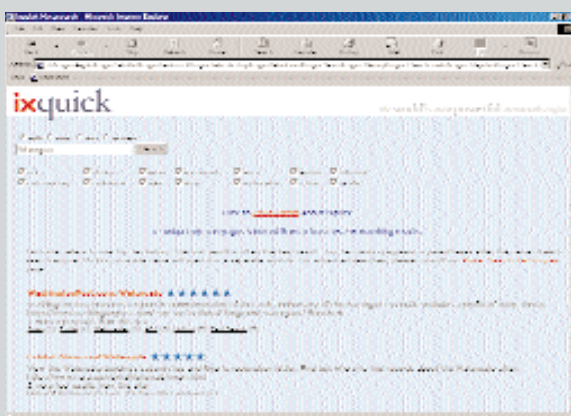
Ask Jeeves

Ask Jeeves is something of a unique searching tool, in the fact that it asks the user to type in language-based questions. Based on the wording of the question, it then displays results in four categories. There is a list of previously asked questions that relate to the topic, a list of Web sites related to previous answers, a selection of related topics for searching, and a list of sites found through other engines. This means that upon entering your question, you might not get an instant answer, but you do get enough links to select the appropriate one which is likely to provide an answer.

There is a useful bar on the main page that shows other questions being currently asked, which can quickly give an effective idea of what this engine can be used for. The set up is aimed at

less experienced Internet users, who may be confused by other search engines. The advantage of Jeeves is that instead of displaying a list of Web sites, its topic-based answers mean you are less likely to end up in a site that is unrelated to what you are searching for. Speed-wise, Jeeves is about average. It does not have the option to customise a search, as many other engines offer, but this is not really within the needs of its target audience. On the flipside though, it can be amusing to type in questions and see what answers you can get – have you ever considered asking a computer how to go about making a baby?

PCPlus Verdict 6/10



www.ixquick.com

Ixquick

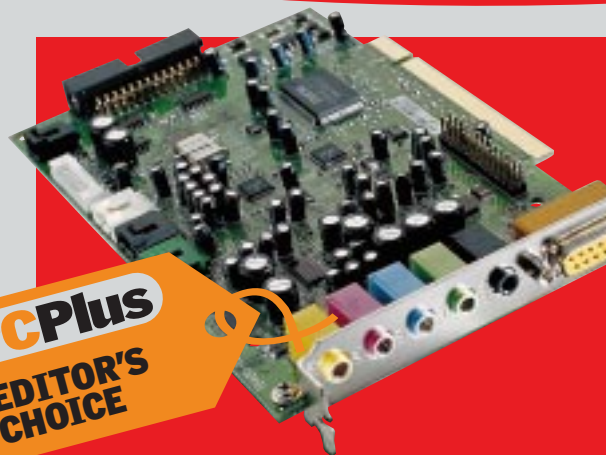
Ixquick is a meta-based search engine, meaning that instead of trawling its own database of Web sites, it simply sends your request out to a number of other search engines, and then compiles the results.

Ixquick uses a star rating system, awarding a star for each engine that returned a specific site, enabling you to quickly ascertain the quality of each result. Ixquick also supports search modifiers, such as 'and' or 'not', and wildcards. Wildcards are represented by asterisks, and act as a place holder for any number of unknown characters. For example, if you were to type 'brit*', you would receive hits on subjects like Britain, or Britney Spears.

In terms of results, the star system is surprisingly effective, with anything more than six stars generally indicating you have found what you are looking for. The results are listed in the classic fashion, with small text showing the engine where the hit has come from.

Due to its ability to accept search modifiers, Ixquick does not have a customise search option, but as it only takes a few minutes to learn the modifiers, this is no great loss. Ixquick is remarkably easy to use, and is fairly quick on the response times.

PCPlus Verdict 7/10



SOUND CARD

VideoLogic SonicFury

PRICE £80 **EX VAT** £68 **SUPPLIER** VideoLogic
PHONE 01923 277488 **ONLINE** www.videologic.com

A six-channel sound card, which comes packed with new-wave features

Creative has had the sound card market pretty much to itself over the last year or so. If there's any justice in the world, things are set to change. VideoLogic's SonicFury has been co-developed with the US company Turtle Beach, who makes professional MIDI cards for the music industry. Turtle

Specifications

Crystal CS4630
SoundFusion DSP; 8MB
DLS synthesiser;
64-voice hardware
polyphony; 48kHz
sample rates; six
speaker channels

Beach sells VideoLogic's excellent Sirocco range of speakers in the States and these would be a perfect match for the six channels of the SonicFury.

Based around a Digital Signal Processor (DSP) chip from Crystal, the SonicFury starts by offering a very impressive hardware specification. It can handle sound sampled at up to 48kHz, higher than CD sampling, and can play back 20-bit sounds, giving high definition.

For musicians based on PCs, there are 64 hardware MIDI channels, plus virtually unlimited software ones. There's an S/P-DIF jack socket on the card, but if you want separate S/P-DIF (the socket is used for other things, too) you'll need to add an upgrade to provide it.

You get all the sounds into and out of a SonicFury, there's an array of five sockets, nominally labelled Front, Rear, Line, Mic and Channels 5/6. I say nominally, as the CH 5/6 socket is what VideoLogic calls a Versajack and can be set through software to act as a centre speaker output, S/P-DIF jack or a secondary stereo line input, for four-channel recording.

Sound and effects protocols supported include EAX, A3D, DirectSound3D, Sensaura's MacroFX and several others. It supports Dolby Digital 5.1

output and can drive all six speakers itself, though it can also handle two and four speaker set-ups.

The bundled software reads like a home musician's wish list, from Voyetra's Audiostation for regular media playback, through Making Waves and Midi Orchestrator 32, to Music Write 2000 and ACID Xpress. You can rip tracks and record MP3, you can DJ on digital tracks and record your own stuff from scratch. Many of the sound and music tools are full versions, too, rather than the Special Edition hatchet jobs you often see.

This is an excellent, next generation sound card which you could imagine costing over £100. To find it's only £80 confirms what great value is available here.

Simon Williams

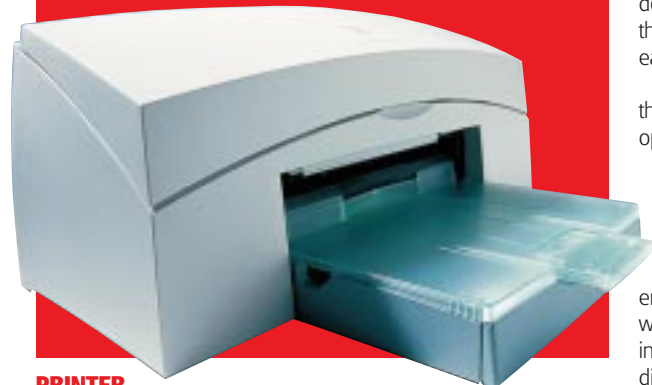
PCPlus Verdict

VIDEOLOGIC SONIC FURY

- | | |
|------------------------------------|--------------------------|
| ✓ FOR | ✗ AGAINST |
| → Six-channel sound | → Nothing of consequence |
| → Multi-function Versa-Jack socket | |
| → Buckets of supporting software | |

Specifications	9
Quality	9
Performance	10
Value for money	10
OVERALL	10

↓ The Xerox DocuPrint M750 – so big it may scare small children. And laptops.



PRINTER

Xerox DocuPrint M750

PRICE £99 **EX VAT** £84 **SUPPLIER** PC World
PHONE 01392 429469 **BUY ONLINE** www.xerox.com/inkjet/uk

The latest in Xerox Thermal ink-jet technology is here, and it's huge

The Xerox DocuPrint M750 is not for those of limited desk space. If you want it to sit next to your PC, realistically you're going to need an area of about 50cm squared, considering the paper tray and the cables. That being said, you do get quite a lot of printer for your money. The M750 is aimed at small business users,

System Requirements

64MHz, 486 processor
16MB of RAM
Tested on
PIII 500MHz, 128MB
RAM, Win98

those in the office environment on a limited budget, and offers a reasonable deal for its price. It has many features that make it stand out as a particularly easy-to-use system.

You are offered a choice of connecting through the standard parallel port, with the option to purchase a USB cable for further flexibility. This should appeal to portable users, as a chance to own a peripheral that is almost three times the size of their PC. The M750 feature two bays for loading paper: A4 sheets and envelopes sitting in the front mounted tray, with the option to feed lengths of paper into a bypass tray on the back. Located directly below this is a handy rear access door to assist the user in case of a paper jam, but the opportunity to try this did not arise during testing. Even when the printer accidentally swallowed 15 sheets of paper at once (because of confused loading technique on the part of the reviewer) they were simply spat back out almost instantly, albeit streaked with ink.

The print heads represent the latest advances in Xerox's ink-jet technology, with a claimed number of 600 ink nozzles per square inch, meaning that each nozzle is one six hundredth of an inch from the next one. This was closely inspected, but without the aid of an electron microscope, the results were inconclusive. The results of the print testing, however, were pretty spectacular. When printing colour, this machine is not the fastest, but the results

are vibrant and precise. Printing black and white is not too slow, and using express mode for optimal speed over quality, the M750 can do up to 10 pages per minute. Other features include the intelligent colour system that allows the user to change specific colour cartridges, so if they have just printed 40 copies of the Swiss flag, only the magenta cartridge needs to be changed, not the whole colour cartridge.

Aside from its ponderous bulk, the only other flaws are a mediocre manual, that does the job, with a complex trouble-shooting section. Also the plastic paper rest that protrudes from the front would break with a minimal amount of pressure, but aside from these minor flaws, the M750 is an effective product.

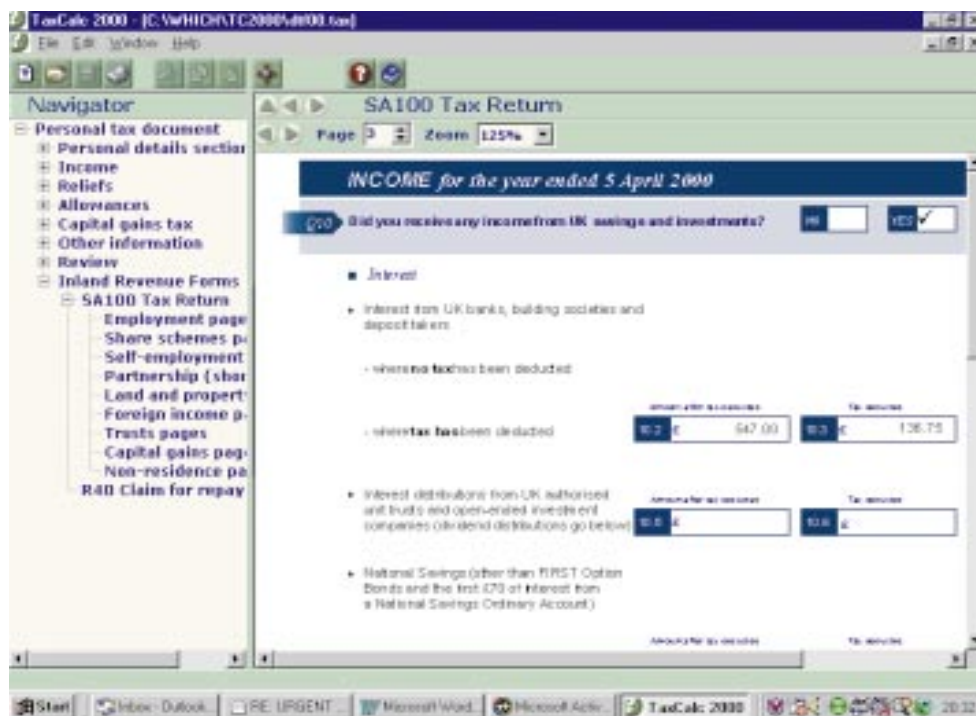
Joe Lees

PCPlus Verdict

XEROX DOCUPRINT M750

- | | |
|------------------------------|----------------------|
| ✓ FOR | ✗ AGAINST |
| → Choice of Speed or Quality | → Space requirements |
| → Easy to set up and use | |

Specifications	7
Quality	5
Performance	6
Value for money	9
OVERALL	7



TAX FILING SOFTWARE

TaxCalc 2000

PRICE £25 EX VAT £21 SUPPLIER Which? PHONE 0800 252 100 BY ONLINE www.taxcalc.com

If filling out tax returns is a hard task then a good investment is TaxCalc 2000

EIGHTEEN years ago, when Which? produced the first edition of TaxCalc we wouldn't have given it a second glance. Computers were expensive and filling in the tax return relatively simple. Those were the days!

Now, for the 9 million of us who hear the dull thud of a buff envelope on the doormat every April, life is not so easy. It is an extremely brave individual who is willing to work his way through a very complicated 29-page form in order to satisfy the increasingly rapacious demands of the Treasury.

TaxCalc aims to take the drudgery out of the task with the added bonuses of checking how much you owe or are owed and giving you the option of filing the return online. Hector is so keen on this method that there is even the offer (not promise, mark you) of a £10 discount if you file and pay electronically.

The program comes on both CD and floppy disk with a 36-page user guide covering what you need to know to run the program including the invaluable help line details. Guidance on the tax rules is contained in a context sensitive help file within the program and if you want broader advice and are a Which? subscriber you can find it in the annual Tax Saving Guide.



↑ Our first attempt at online filing resulted in an enigmatic and unhelpful error message from the Inland Revenue. Hector will need to do better in future.

As previous users of the program we were able to open the 1999 file and save it in 2000 format. This saved the tedium of filling in personal details but first you need to delete all the obsolete data from last year otherwise you'll get confused. New users have to start from scratch but it doesn't add much to the overall time taken. We had assembled all the relevant information such as P60, P11D and dividend slips and were able to complete the form filling in about twenty minutes. Unfortunately, Hector hadn't sorted out his online filing software so we had to wait a further two months before we could submit the return.

Online filing is a bit convoluted and we didn't get it right first time. You need to log on to Hector's Web site at www.inlandrevenue.gov.uk to register and

about a week later a snail arrives with a unique user ID. Armed with this we set about our task only to have the file rejected with the enigmatic note "Input value is not a valid number". A careful search through the return failed to detect anything that looked like an invalid number so we consulted the TaxCalc help line by e-mail. Our error turned out to be putting some text in a text box where it wasn't needed and once that was deleted the return went off smoothly. You also get an acknowledgement, which is more than you can expect with a snail mail return.

TaxCalc is easy to use. The opening screen is the Navigator which gives helpful advice on how to fill in the various boxes that are accessed by the links. With the paper return you have to remember to fill in the various sheets that

← When you have answered the questions there is the option of reviewing the completed form to check that all is well.

deal with foreign income, self employment and all the rest but TaxCalc sorts this out automatically as you go. After you have

filled in the data you can review the return. There is a series of notes to help you check that you are arranging your affairs in the optimum way to minimise your liability and a detailed calculation showing how the final answer is arrived at. Afterwards you can view the actual return on screen and print it out for despatch or as a hard copy reference.

If you get the return in by 30th September Hector will work out what you owe. With TaxCalc it doesn't matter if you miss this deadline as the program will do the calculation for you and you only need to meet the 31st January deadline, after which you get clobbered with a penalty for being late. Surprisingly, Hector gets quite a lot of money from the disorganised so it pays to be on time.

For any computer owner (except for some reason Ministers of Religion, Lloyds Underwriters, MPs of all sorts and Seafarers) who gets a tax return it really is madness not to use a program like TaxCalc. The very mean will use Hector's own free program called EVR but it won't cope with as wide a range of personal circumstances as TaxCalc and by filing electronically you save nearly half the cost anyway.

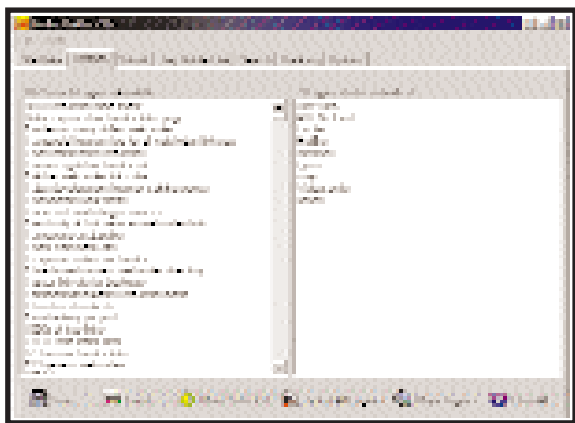
David Frost

PCPlus Verdict

TAXCALC 2000 V6.5

- | | |
|--|---------------------------|
| ✓ FOR | ✗ AGAINST |
| → Easy to use | → No serious shortcomings |
| → Good help line | |
| → Compatible with Inland Revenue online requirements | |

Specifications	9
Quality	9
Performance	9
Value for money	9
OVERALL	9



TRAFFIC BUILDER SOFTWARE

Web Site Traffic Builder Web Master Version

PRICE £130 **EX VAT** £111 **SUPPLIER** Guildsoft
CONTACT 01752 895100 **ONLINE** www.intelliqis.com

Raise your Web site's profile with this versatile software

It's all very well creating the definitive Elvis tribute site, or spending months on the most comprehensive collection of games cheats ever, but it counts for nothing if no one ever finds your Web site. With millions of sites competing for attention,

.....
Requirements
486, Win95/98/2000,
4MB RAM, 5MB HD,
Internet connection
Tested on
Pentium III 800, 256MB
RAM, SVGA, 54GB HD,
Win98 SE, DVD, ISDN
Internet connection

you need to adopt a strategy for promoting your site and submitting it to the most popular search engines. With over 3,000 search engines to choose from, that can be a task in itself, but that's where Traffic Builder comes in.

It maintains a list of search engines, and all you need to do is fill in a simple form, then with a single click, your site

◀ **Web Traffic Builder is a great idea, but it's thrown together without consideration for the user, making it much less effective than it could be.**

will be submitted to as many search engines as you like. Therein lies the fatal flaw with this product: it gives you a huge list of search engines and you can create a personalised list of the ones you want to submit to — but I for one, lack the inclination or staying power to read through all 3,600+ engines selecting the ones that are right for me. To make matters worse, most of the engine names give no clue as to their classification. Do you want to submit your site to the SPU engine? What does SPU stand for — Sex Perverts Union? Super People Unlimited? What?!

Even before you get that far, though, you will need to download an entirely new version of the program and an updated engine list. This really isn't well thought out...

On the plus side, the program does have a few excellent features, such as the ability to check your site's ranking, by

keyword, in the World's most popular search engines. It also offers the option to search for your own site by name in any of the main engines. Unfortunately, even months after using the program, our site wasn't listed in half of the top engines, which rather undermined our faith in the program and the entire registration system.

Many of us are in desperate need for this sort of program, lacking both the time and experience to promote our personal or professional sites effectively. However, this is a half-cocked, poorly realised piece of software that barely raised my expectations in the first place, yet still managed to fall short of them. It could be great, and it would be worth the high asking price if it did its job well.

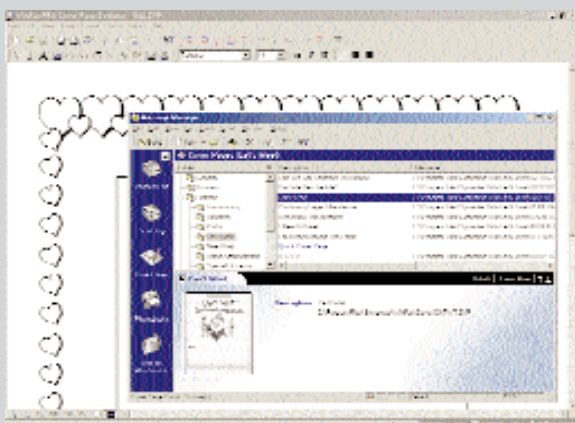
Mat Broomfield

PCPlus Verdict

WEB SITE TRAFFIC BUILDER

- | | |
|---------------------------------------|--|
| ✓ FOR | ✗ AGAINST |
| → Submits your site to search engines | → Lists uncategorized search engines |
| → Can check status of your efforts | → Doesn't provide much advice about how to submit our site |
| → Easy to use | |

Specifications7
Quality5
Value for money6
Performance7
OVERALL7



PC FAXING

Symantec WinFax Pro 10

PRICE £60 **EX VAT** £51 **SUPPLIER** Symantec
CONTACT 0207 616 5600 **ONLINE** www.symantec.co.uk

WinFax acknowledges e-mail and attaches faxes to them. Not as bizarre as it sounds

It's hard to imagine what more can be done with WinFax, the best known application for sending and receiving faxes on your PC. Symantec has found a few extra bells and whistles to add to the software, though, for version 10.

For a start, you don't have to create a fax by using a word processor,

.....
Requirements
Pentium PC, 32MB
memory, 57MB HD
space (full install), SVGA
graphics card, CD drive,
modem/phone line,
Win95/98/NT4/2000
Tested on
Pentium III 800, 64MB
memory, Intel 815
graphics, Zoom
WinModem.

spreadsheet or whatever and printing to a WinFax driver. The Drag and Drop depot, installed on your desktop during set-up, enables you to drag documents directly into the program from one or more other applications. This makes it easy to build up a fax from multiple sources, which was a problem in previous versions.

WinFax has its own address books, but these days, it's more important that it integrates with other address stores.

◀ **There's plenty of room for designing your own cover page in WinFax Pro 10 and the**

While it does this fully with the ACT! contact manager, its integration with Outlook and Outlook Express is more basic. You can set up a link with either Microsoft program so that addresses filter through as read-only entries in WinFax's address book, but the simpler approach, where you use a common address book for both programs, isn't supported.

WinFax 10 offers you the facility to send or forward faxes as e-mails. It does this by wrapping up a fax page as an e-mail attachment and sending it to your default mail program. The attachment includes an integral viewer, so it doesn't require the recipient to have fax software installed to be able to view it. The viewer adds 75K to the size of the attachment, which shouldn't increase download times too much.

If you receive faxes which require signing before faxing back or forwarding

to a third party, the new WinFax can help, as it speeds up the use of digital signatures. The program has long had the ability to annotate faxes with various bitmap 'stamps' and it's always been possible to use one of these for a scanned signature, but the process of signing is now simplified with a dedicated signature stamp. Mind you, if you don't have a scanner, the only way of getting a signature into the program is to get someone to fax it to you, which is a bit convoluted.

All these extras make WinFax Pro 10 even easier to use, but it's still big and quite slow in operation. Overall, you wonder how many more versions it can go through before the whole concept of faxing is replaced by e-mail.

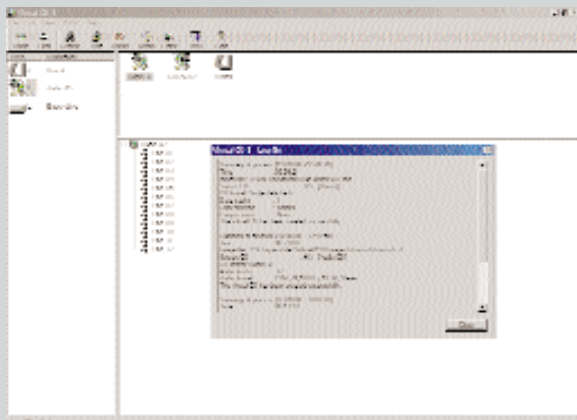
Simon Williams

PCPlus Verdict

WINFAX PRO 10

- | | |
|---|--|
| ✓ FOR | ✗ AGAINST |
| → Drag and drop documents to assemble fax | → Partial integration with Outlook/Outlook Express |
| → Send fax as e-mail | → Doesn't recognise some modems |
| → Share fax modem across network | |

Specifications8
Quality7
Value for money7
Performance8
OVERALL7



VIRTUAL CD

Microtest Virtual CD V3

PRICE £30 **EX VAT** £26 **SUPPLIER** MediaGold Publishing
PHONE 0207 221 4600 **WWW** www.virtualcd-online.com

Ever get tired of losing or scratching your CDs? Check out Virtual CD V3

In the current computer market, the CD-ROM drive is almost a universal standard. It is, however, not without its drawbacks. Read speeds have been increasing for some time, but data access is still nowhere near as quick as it is from a hard drive. The CDs themselves are not the toughest medium of data storage, when a small scratch to

Requirements
 Win 9x with 32MB RAM or Win NT4/2000 with 64MB RAM, 200MHz processor, Direct X V3 or later, 10MB hard disk space for program, Direct Sound compatible sound card

the surface can render the disc unusable, infuriating if you have just spent £30 on new software. Help is now at hand, in the form of Virtual CD V3.

When you use this software, it enables you to create a virtual image of your CD in your hard drive. This image, or copy has been compressed down to save disk space, and assigned a letter just like a hard drive. That's all there is to it. The application can now be run from the hard

← **Virtual CD V3 offers you the chance to make virtual CDs on your hard drive, and run several at once.**

disk without having the CD in the drive. If you swap hard disks between machines, you can

now run an application that was dependant on a CD on a machine that does not even have a CD drive.

This system should also appeal to laptop users, as the CD drive is one of the most power draining modules inside the PC, meaning that by using Virtual CD V3, you will be able to get longer battery life from your machine.

The number of virtual CDs you can have is directly related to the space available on your hard drive, but with modern drives being measured in gigabytes, this should not be a problem. To the computer, the virtual CDs are indistinguishable from the real thing, meaning that if you put an audio CD on your hard drive, it can still be played through the Windows CD player.

Games player especially should find this product interesting, as most games insist that you have the CD inserted while you play the game. Using this software however, I was able to run Unreal without the CD, and listen to a virtual copy of an audio CD at the same time, with all data coming from the hard drive. There was no noticeable slow down in the game, no conflict between game sound and the virtual CD music, and no loss of sound quality through buffering in any of the audio either. The only problem with this product is that by making a copy of the CD onto your hard drive, you may violate the licensing laws you agreed to when you installed your game or application. Aside from this, the Virtual CD V3 is an exceptionally useful piece of software.

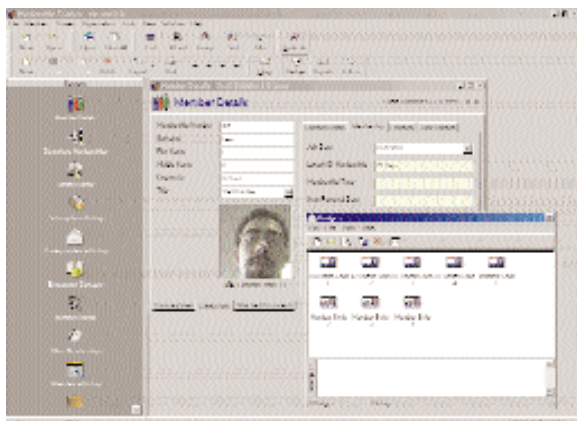
Joe Lees

PCPlus Verdict

MICROSOFT VIRTUAL CD V3

✓ FOR	✗ AGAINST
→ Increased efficiency	→ Can take up too much HD space
→ No more scratched CDs	
Specifications	8
Quality	9
Performance	8
Value for money	8

OVERALL **9**



DATA BASE GENERATOR

Vizual Business Tools Membership Tracker

PRICE £116 **EX VAT** £99 **SUPPLIER** Vizual Business Tools Ltd
PHONE 020 8663 4500 **WWW** www.vizual.co.uk

If you run an association, Membership Tracker helps you keep on top of the admin

Membership tracker is a program which enables you to generate a series of data bases, and keep track of them. It has a strong emphasis on preset templates, so if you've never built a database before,

Tested on
 PIII 500MHz, 128MB RAM, Win98
Requirements
 P166, 32MB of RAM, 30MB hard disk space

don't worry, there is nothing to stop you from using this program as long as you can use any Windows based word processor. One of the advantages is that it can be as simple or as complex as you want, being suitable for running a local football club, or maintaining a larger organisation that might have a nationwide membership.

One of the key points about this program is the ease with which you can input various forms of data. For example, once you have created a record of your members, you can plug a digital camera into your USB port, and up-load captured images into their individual records. You can use these to print out an ID badge for them, based on a set of pre-defined templates. A company logo can also be imported and added to the badge.

Membership Tracker is primarily an organisational tool. Its built in diary can be configured to remind the user of key dates relating to individual members. It contains a built in word processor, with the option of using this, or Microsoft Word. The word processor is adequate, and contains a large number of templates, so all you have to do is specify who the letter is addressed to, and the wizard takes care of the rest. Another wizard is dedicated to compiling reports, so if you need to see who has

(or hasn't) paid their fees this year, a list can be compiled quickly, side stepping the data entry that would accompany this task if you were to do it manually.

Records are identified by a unique number, and can be as detailed as including medical and dietary requirements. One of the most useful functions is the ability to keep archive records of correspondence, an essential inclusion for anybody trying to manage a large organisation. It is hard to fault this product. The only negative point that I encountered is a conflict with my digital camera, but this is by no means unusual if you plug a lot of peripherals into your machine. This could be a secretary's or organiser's best friend.

Joe Lees

PCPlus Verdict

VIZUAL BUSINESS TOOLS MEMBERSHIP TRACKER

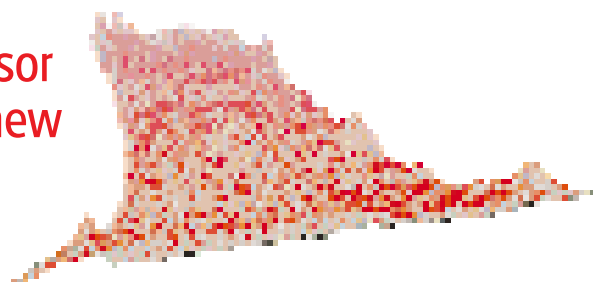
✓ FOR	✗ AGAINST
→ Easy to use	→ It costs £116
→ Compatibility with other systems	
Specifications	8
Quality	8
Performance	8
Value for Money	7

OVERALL **8**

SPECIAL REPORT

The digital music revolution: Compression wars

→ MP3 has been the most popular compressor since its release, Joe Lees investigates two new pretenders to MP3's crown



Digital music over the Internet has rapidly sprung to the forefront of popular culture, largely on the back of the MP3 format. Sure, we know that digital music has actually been around for ages, but it seems only to have permeated the national consciousness in the last few years. MP3 files are some of the most commonly accessed types of data on the internet. The reason behind their massive popularity is the freedom with which they are distributed. Album prices in the UK are not cheap, and so to the casual user, downloading music from the internet means you no longer have to spend ten pounds just to hear a selection of new songs.

MP3 is currently the most popular digital compression format going, without a doubt. The format would not be half as popular if users had to pay a fee every time they made a download. MP3 is not a guarantee of CD quality sound. The beauty of the MP3 system is the depth and variety of files available to download. If the song you want has ever been cut and distributed, chances are you can find it in MP3 format somewhere.

Obliviously, many of the companies and corporations who make money from the established music distribution networks were terrified by this new medium for music. The concept that you

“When you listen to a piece of music, you don’t want to sit there while your machine chats to a server in Texas”

can get music for free is abhorrent to certain portions of the music industry, as can be seen in the Metallica Vs Napster battle and ensuing fallout. To an extent, this issue has been addressed through the introduction of streaming technology. The problem is, when you want to listen to a piece of music, you don't want to sit there for a minute while your machine chats to a server in Texas. It is conceivable that in a few years time, connection speeds will be fast enough to enable streaming as a realistic and instantaneous method of listening to audio on your computer, but at the

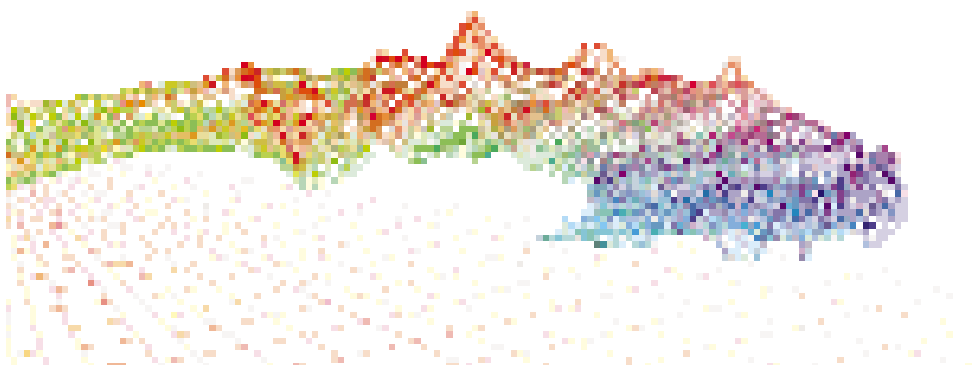
moment, this is not the case. This is why downloadable files are still massively popular. Once you have downloaded the file, it's yours to play as you wish, on your computer, MP3-Player, or even taped onto a Walkman.

So a race has begun to try and develop a new medium for digital music, in which the evil pirates are locked out of other peoples musical libraries, and forced to buy albums at full price like everybody else. Or something. Anyway, on April 12th last year, Microsoft unveiled the solution in the form of its new MSAudio v4 format, shortened to Windows Media Audio or WMA. This wonderful new format promised to deliver better than MP3 sound quality at half the file size.

Quality wise, WMA format can vary depending on the bit rate you encode at. At a low bit rate of 64kbps, there is not that much difference between WMA and an MP3 recorded at 128kbps. The WMA format is better at preserving treble sounds, which can sometimes get lost in the mix in MP3 files. At higher bit rates, sound artifacts, that is noises you don't want to hear, can creep into the file. I have yet to see this problem occur with MP3 files. It is worth remembering that any MP3 or WMA file is only as good as the original source file it was encoded from – usually a WAV file. If the WAV was recorded onto the encoders hard drive through analogue cables, or from a tape cassette, there will be artifacts in the recording, and the compression of the audio file will only serve to highlight this. If quality is your overriding factor in choice of compression formats, it has to be MP3.

The WMA format is not completely useless though. For example, if you want

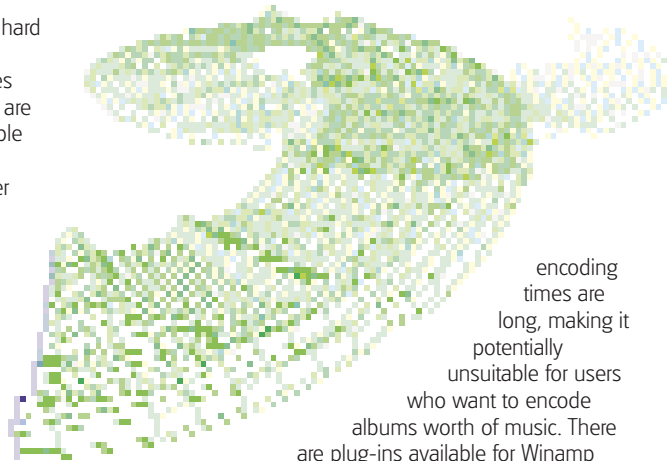
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Codecs used:
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www.microsoft.com
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to rip music from CD to keep on your hard drive, it is much quicker to encode in WMA than it is in MP3. The exact times will vary, based on the processor you are using and the amount of RAM available in your system. Microsoft claims that encoding with WMA is "20 times faster than with MP3, and decoding is 25 times faster." So, if you want to store large amounts of music, the WMA format could be the compression code for you.

One of the original ideas behind the WMA format was to enable users to place restrictions on their files. Once the file has been encoded, you can set the time period the file can be used for, or the systems it can be used with. This would seem to indicate that the WMA format was to be used as a purchasable commodity. Unfortunately for Microsoft, it was not long before software appeared on the Internet that could break these restrictions. Programs such as Unf**k.exe, or Total recorder have the ability to re-sample files, bypassing all of the user defined limits. In theory, this should make WMA as accessible as MP3, but the reality is that in terms of available downloads, MP3 still dwarfs WMA. This could be set to change though, as now portable playback devices that are compatible with the WMA format are being released on to the market.

WMA is not the only format to challenge MP3's supremacy. Another effective compression format on the scene is VQF. Developed by Yamaha, it offers a slightly better compression rate than MP3, with no loss of quality, apparently. It is more processor intensive however, and trying to play music with it whilst you defrag your hard drive and download DVD films from the Internet at the same time is going to result in severe sound disruption. Also, like WMA, it suffers from a serious lack of files available to download. Unlike WMA, the



↑ This is a 3D representation of an MP3 file captured using Whitecop.

encoding times are long, making it potentially unsuitable for users who want to encode albums worth of music. There are plug-ins available for Winamp which allow you to play VQF files.

In an attempt to establish some credence to all the claims and counter claims about the effectiveness of these formats, I set up a simple test. Using a demo version of Fruity loops 2. I composed a five minute long WAV file, with emphasis on both high range and low range sounds (treble and bass). By composing the file, I knew exactly what each original sound in the loop should sound like, enabling me to make an accurate quality assessment. The resulting WAV file was 50.3MB in size. I then encoded the master WAV file using MP3, VQF and WMA compression codecs. I decided not to settle on a universal bit rate, but adjusted it for each to try and get the best quality out of each file. The results can be seen in the following table.

As this table shows, each format has its own relative strengths. The WMA codec is incredibly quick, compressing the monster WAV in just under a minute, leaving the other two standing. That being said, the final file size is not that much smaller than the MP3. The WMA file also performed poorly in Winamp, with artifacts clearly heard in the output. These manifested as clicks, tending to merge in with the bass sounds. The VQF codec is neither unreasonably fast or

slow, but does offer an excellent rate of compression, reducing the master track to a minuscule 3.43MB. Quality wise, it was pretty indistinguishable from its counterparts, but the difference can definitely be heard between it and the master track. Finally, the MP3 codec took the longest to encode, and produced the largest file at the end. It's worth noting that MP3 is the oldest of the compression formats tested here. This test was by no means comprehensive, and is not the definitive statement on compression. If you feel you must know which format is superior, I suggest you run your own tests, with a variety of files and codecs, and then draw your own conclusions.

One of the most confusing aspects of these compression codecs is that there is no standard benchmark for audio quality. Therefore, the producers of each codec can claim that theirs has the best sound quality. This quality is dependant on so many factors that vary between each end user, it can be hard to realistically assess the sound.

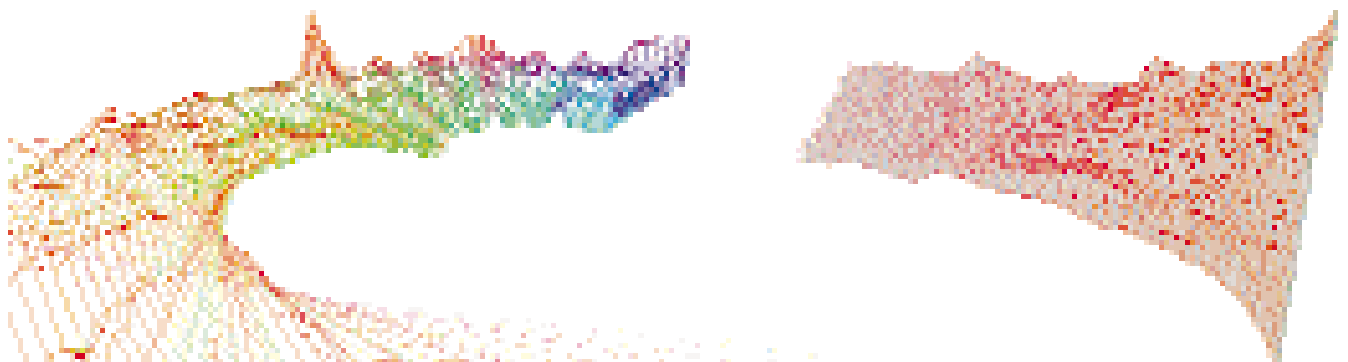
As mentioned earlier, a compressed file is only as good as its master copy. Then, it passes through the computer sound system, which could be a plug-in sound card, or an onboard sound module wired in to the motherboard. The quality of the module's manufacture, and the composition of the output ports can all affect sound quality. The room you are listening to the music in can highlight or hide aspects of sound due to acoustics and ambient noise. Finally, the most essential ingredient in sound quality is the output device: speakers. Most speakers that are supplied with a PC are not really designed with quality musical output in mind. There is also a huge variety of PC speakers on the market, each with their own qualities and failings.

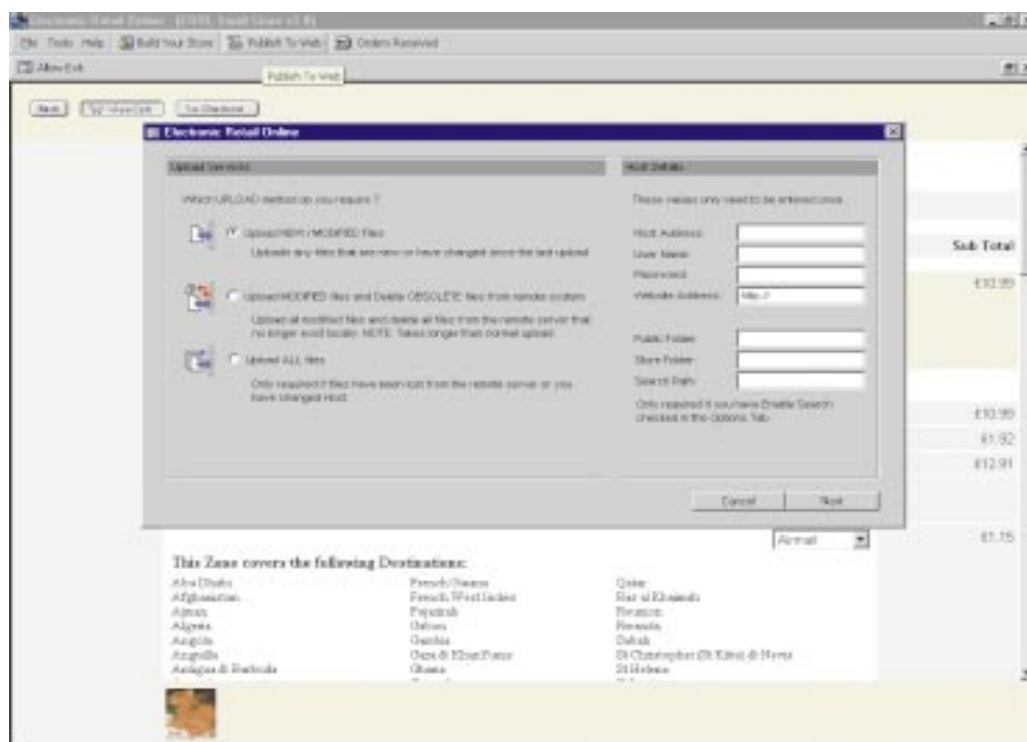
This is what has probably sparked the numerous arguments I have witnessed being conducted over bulletin boards, concerning which is the superior compression format. So, if you are still wondering which side to join in the latest round of the compression war, there is no easy answer. The best thing to do is to try all of the formats on offer, and see which works best for you. The choice you make will largely be dictated by your needs, and if your need is just to obtain free music, I think you already know where to look. **PCP**

→ Compressors put to the test

Two new compressors were tested against the leader to see if MP3 needs to worry

Compression Format	Bitrate	Time taken (min:sec)	Compressed file size	Sound quality
VQF	48 KB/s	5:24	3.43 MB	8/10
MP3	160 KB/s	5:30	5.72 MB	8/10
WMA	128 KB/s	0:55	4.62 MB	6/10





Store builder: Full program

EROL 2 Small Store

Sell, sell, sell. Build your own online store and watch the money roll in



After a great deal of waiting, we can finally deliver to you, EROL 2 Small Store Edition - the shiny new 10 product only edition of this just released store building program. There are several mid-range packages that provide all the tools to set up a online shop straight out of the box, but EROL takes this one step further. EROL offers everything you would expect from a store building package, combined with staggeringly powerful design and layout control that is unprecedented in any similar offering.

Developed by Dreamteam Products, the software arm of Web agency Dreamteam Design Ltd, EROL 2 Small Store Edition is so simple to use that it's easy to forget that the product itself is very powerful. Practically any store layout or design you can imagine can easily be produced using EROL 2 Small Store, never mind the robust and feature rich e-commerce back end.

Off your trolley

To get started with EROL 2 Small Store Edition, simply install the program from the **SuperDisc** and run it from the icon it creates on your desktop. When you run EROL 2 Small Store Edition for the first time, you'll be prompted to register the software. Enter a valid e-mail address, but make sure you're online so that your registration information can be sent straight to the EROL servers. You will get an immediate response, which will activate the Enter button (it will also let you know about any new patches and updates for the software). You are now ready to build the most beautiful online store of your life.

Not only is EROL 2 Small Store Edition intuitive from the start, but it is also great fun to use. In fact, once you've spent a few minutes playing around with all the settings and adding a few pages, you'll feel so comfortable and confident about using, that you'll want to recommend it to everyone.

The building process is a simple one. Your EROL store consists of pages, just like any Web site, which are populated with items. EROL divides its page items into three colour-coded categories: display items (green), which are typically titles or header images, or even freeform HTML; link items (blue), which you'll mostly use to add buttons and links to other pages and products in your store, as well as to external Web sites; and most importantly product items (red) which as the name suggests are the actual products you plan to sell in your store.

Shelf Stacking

EROL 2 Small Store Edition's most impressive feature is its design tools. The clever and simple-to-use Template Editor enables you to create pixel perfect item templates which can be applied at any time and to any item in your store. Taking it that step further is EROL's remarkable layout engine, this makes great use of advanced

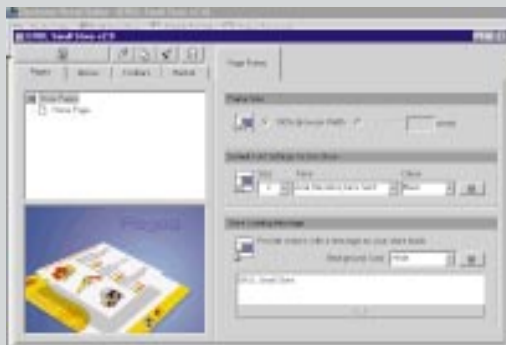
HTML tabling to get your designed items to sit in any formation or layout that you can imagine. The fact that EROL's programming is browser compatible all the way down to Version 3, makes it all the more impressive.

If you're scared of coding, or don't know the difference between an HTML table and an IKEA chair, there's no need to worry. EROL's tools are all point and click with friendly tools to help you through. However, master coders can really go to town with the advanced design opportunities.

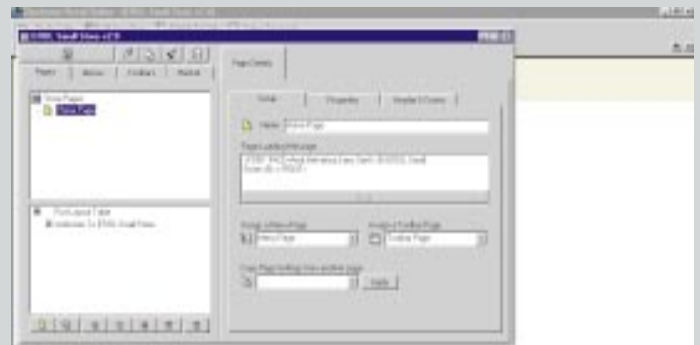
Hardened Web designers will also be pleased to hear that EROL 2 Small Store allows you to paste in large amounts of pre-formatted HTML - it is a useful addition if you're not keen on the built in Web Editor. In fact, the developers claim that 70% of your store can be designed outside of EROL in Dreamweaver, FrontPage or other Web design packages. But why would you want to when it's so easy with this program. Enjoy!

How to use EROL

Use this step-by-step guide to start building your own online store



1 Launch the administrator window by clicking Build Your Store. The first thing you must do is set up the default settings for the other pages you are going to add to your store. The other tabs above the Tree View enable you to set the defaults for the other frames in your store, or give you the opportunity to turn frames off all together.



2 Selecting the first page in the Tree View - the home page - activates the various options for that particular page in the area on the right. The bottom half of the Tree View is where all new items will be added to the page. Initially there are no items on the page.



3 Selecting first layout table activates the various layout options you can apply to your page. These options will determine the layout of all subsequent items you add to your page. You can add further layouts to the page yourself if you require more complex designs



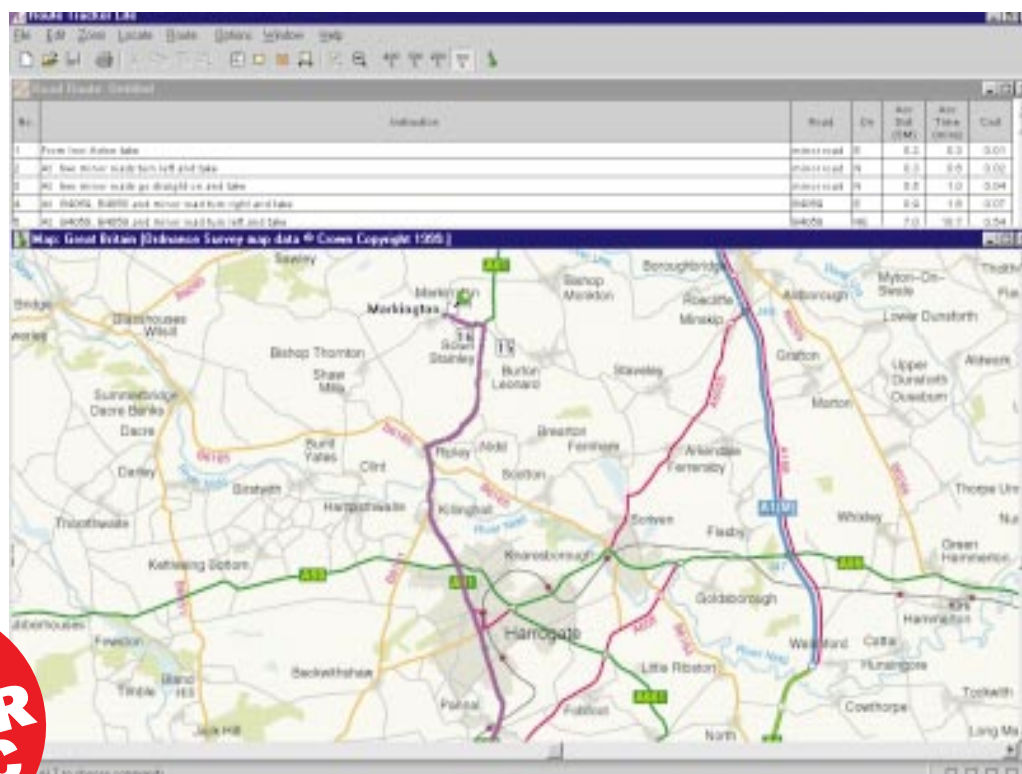
4 Click the red Insert Product button to add your first product to the page. The settings for the product will become active in the area on the right and you can input all the relevant details for that product, such as an image, descriptions and pricing details.



5 Before committing your product to the page, select a pre-designed item layout template. If you don't like what you see there, click Edit to launch the Template Builder, this enables you to build templates for your products.



6 Now it is time to check the changes you have made. Click the Update button, which saves your work, reloads your store page into the EROL browser and minimises the Administrator window so you can clearly see your new changes.



Route Planning: Full program

Route Tracker Lite

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This issue we've given you Route Tracker Lite on the **SuperDisc**. However the Lite version simply finds you the shortest route getting from A to B. The Standard version also calculates and displays the shortest, quickest and cheapest routes. It features over 220,000 named features and places of interest, so you should be able to find a route that suits you. If you get hungry, it includes a pushpin database of service stations. So why not upgrade to the full version. As with the Lite version,

this software is produced from up to the minute Ordnance Survey maps you can rest assured that the information that you are going to get is correct. It also supports GPS so if you've got a receiver, you'll always know where you are. To upgrade, go to www.routetracker.co.uk to place your order. You won't be charged for postage and packing on Web site orders. You can also phone ISYS Marketing on 0870 9001820 or contact the company by fax on 020 7681 1790

It's a mere 33 miles to Weston Super Mare. You've got a full tank of petrol, a bag of humbugs and you're wearing leather driving gloves – let's go.

Wait wait, that's all very well, but what do you do if you don't know how to get to your intended destination? Getting from A to B can be difficult at the best of times. Maps can be confusing and don't tell you the quickest route either. Luckily on this month's **SuperDisc** you'll find a copy of Route Tracker Lite which will help you arrange your journey.

The program comes with its very own route planning tool and it's very easy to use. All you have to do is choose the start and finish locations for your journey. All of the directions needed for the trip are calculated for you. Your planned route gives you all the information that you will need, including road numbers, distance between points and the direction in which you should be travelling. As well as calculating the directions for your journey, Route Tracker includes

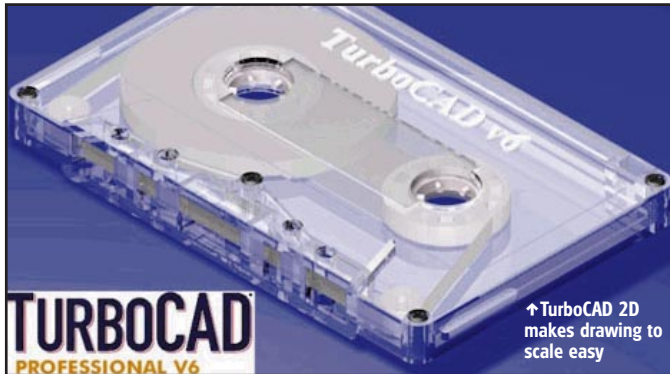
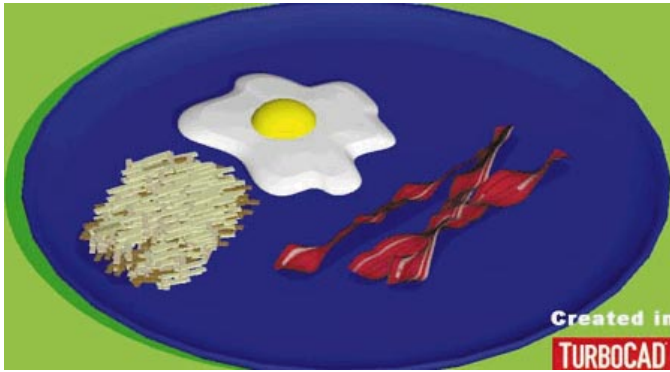
detailed Ordnance Survey maps. You can use these maps to home in on the area that your journey covers. Once your route has been calculated you can print out the directions and the map as well. What makes Route Tracker different to other currently available navigation software programs is that it includes all the names that appear on the Ordnance Survey Landranger 1:50 000 scale maps, so you not just restricted to planning your journey around town and village names. You can choose to go via historic monuments, tourist attractions and even geographical landmarks. Of course, the proof of the pudding is in the eating, so I gave the program a trial run on a recent journey I made to Yorkshire.

Compared to my map planning it gave a similar route to the one I would have taken, and I did find it reassuring to have a professional printout by my side rather than a tacky worn out old map. So if you're planning a long journey, you can't go far wrong with RouteTracker Lite by your side.

Paul Ravening



Order now at www.routetracker.co.uk



Design software: **Full program**

TurboCAD 2D 6.5



Designing need not be a chore. Improve your skills with one of the leading CAD packages in the world



Almost all computer owners have a word processing program. They use it often, and find it very helpful. After all, a word processor is a useful tool for a variety of tasks. Computer users realise you don't have to be a professional writer to make good use of a word processor.

For some reason, many computer users assume CAD (computer-aided design) is just for technical professionals. They don't see themselves using the same software that architects use. Ask computer users why they don't have CAD and the answer will be that it's misunderstood.

CAD programs don't have to be complex. They don't require drawing ability. As for usefulness, few programs are as versatile as a CAD program. Having obtained TurboCAD 2D free on your **SuperDisc**, you already know CAD is not expensive. Yes, there are CAD programs that cost thousands of dollars, but with practice you can draw with TurboCAD easily.

Good software should go beyond the simple automation of a task and provide an opportunity for expanded capabilities. Spreadsheets and accounting software, for example, make it possible for people without training in accounting to do their own financial record keeping. TurboCAD provides a set of tools and an ease of use that allows anyone to create drawings for a wide variety of applications.

It's easy to see that TurboCAD is a versatile software tool. People

who never dreamed of buying a drafting table have used CAD for real estate appraisal and sales, facilities planning and arts and crafts. The same software used by architects to design houses can be used by storekeepers to plan retail layouts. Sales representatives use CAD software on laptop computers to draw in the field specifications. Police officers use it to prepare accident reports. The list of applications, both professional and amateur, goes on and on.

Too many people only have word and number tools in their toolbox. TurboCAD makes the visual design tool a practical addition to any computer. Once you understand how this tool works, you'll find many uses for it.

CAD surpasses the precision of manual drawing. When you draw a line with TurboCAD, the line has an exact length, which the program stores with 16-bit floating point precision. Every line, circle, and so on, is on a co-ordinate grid, the exact location of which TurboCAD stores in memory. When drawing by hand, it's easy to be sloppy and let a line go an extra 1/32" or so, or to jiggle the compass when drawing a circle. Such imprecise actions are impossible in TurboCAD. Circles are true, angles are exact. Commands known as Snaps allow you to attach one object to another with extreme precision at exact locations.

The other advantage of CAD programs is that you draw in full scale. This means you use the actual dimensions of the object you are drawing. When drawing a house

plan, for example, you draw a 12-foot wall as a 12-inch wall, not as a 6-inch line that represents a 12-foot wall.

If you have done manual drafting, you can appreciate the advantages of working with full scale. It is no longer necessary to figure out the scale before you begin to draw. Full scale is a less intimidating way of drawing, you focus on capturing your ideas.

CAD is a viewing window into your own design, which can be any size. If you are drawing a 2,000-square-foot floor plan, for example, it will easily fit onto your computer screen.

TurboCAD can easily take your full scale drawings and print them either at a scale that fits the page, or at a scale which you select. It's that easy. Enjoy
Paul Ravening



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Learning Java: Full program

Everything you need to program in Java!

Java is a natural language for programming the Internet and JBuilder 3 is a natural tool for writing it. Take your first steps with **Ian Sharpe**



→ Learning Java!

Have Java running in minutes with this guide

Fancy learning Java but don't know where to start? Fear not because we've included a full collection of previous Java tutorials, freshly plucked from past pages of **PC Plus**. Just look in the Features section of the **SuperDisc**. You'll need Acrobat reader to open the relevant PDF files but we've included that software on the discs too. Happy Java building.

NOTE:

To run the JBuilder software, please enter the following code when prompted:

Serial number
200-000-1446

Key
B1X5-X0X0

Anybody who reads Huw Collingbourne's Java Workshops can't fail to be impressed by how much he achieves in a two page article. Whether teaching you the basics or getting a little more advanced, Huw manages to demonstrate just what light work Java makes of Internet programming.

Borland JBuilder 3 Professional is a very capable Java development environment. With a little guidance from us you will have your first program running within a few minutes of installation.

The first time you run JBuilder it opens a special project designed to teach you everything about the system. This includes tutorials on building your first Java applications. If you're new to Java, we recommend that you study these after reading this article. Although the Borland file is quick and easy, it is based on an application. You are probably more interested in how to get an applet on to a Web page, so that's what we're going to show you.

Create an applet

Close the Welcome project; you can easily retrieve it later from the Help menu. Start a new applet from File / New. Double-click the Applet icon to start the New Project Wizard. Change the last two items in the file path to \FirstApplet\FirstApplet.jpr and fill in the title field with 'My First Applet'. Leave the other fields unchanged on this occasion. Click the Finish button. After this has been completed the Applet wizard will then run.

Check the box 'Generate header comments' but uncheck the remaining three boxes. There is nothing else of importance to be done here, but it's worth clicking the Next button to see what the other dialogs have to offer. You will need to use these when you start to produce applets for external consumption. For example, when the applet's width and height need to be set further on in the Wizard. Click Finish and JBuilder will then generate all the files needed for your project to run successfully.

The Project window may seem a little confusing to start with. On the upper left of the screen is a pane showing the project's constituent files. Applet1.java is the source code. FirstApplet.html is the page of notes you see on the right.

FirstApplet.Applet1.html contains just enough HTML to host your applet. This is the page that will be used as a test page.

Click on Applet1.java and the pane beneath will outline the source code which JBuilder has generated for you. The code itself is positioned on the right. Click items in the navigation pane to quickly jump around.

The next step in learning Java is to paint a user interface for our applet. To start, click the Design tab which is at the bottom of the window. In the component palette click the AWT tab. AWT is the Abstract Windowing Toolkit, which is a basic library of user interface components.

Next, make a button and place it towards the bottom of the panel

→ How to create Java graphics for your Web site

Wondering how to begin programming graphical applets? Here's a nudge in the right direction

Java can do much more than create whiz-bang visuals for your Web site, but they're a fun way to start. Take your first step by removing the label from the design we created in the main text. Go to the button's event handler and replace the line of code you added earlier with the ones shown here. Don't forget that Java is case sensitive and can't live without its semi-colons.

When you run the applet now you should see yellow text on a blue oval.

This isn't the fully story on Java graphics, of course. Next you should find out how to modify the applet so that the graphic is repainted when another window covers and uncovers it.

Hint – investigate the paint() and repaint() methods.

```
void button1_actionPerformed(ActionEvent e) {
1- Graphics g = this.getGraphics();
2- g.setColor(Color.blue);
3- g.fillOval(100, 100, 200, 100);
4- g.setColor(Color.yellow);
5- Font myfont = new Font("TimesRoman", Font.BOLD, 48);
6- g.setFont(myfont);
7- g.drawString("Hi!", 165, 165);
}
```

1 To draw on the applet's canvas we must get a handle on the Graphics object associated with it. The applet (which is referenced by 'this') has a getGraphics method which returns a reference to its Graphics object.

2 Now we can use the object's methods and properties. The setColor method changes the drawing colour to Color.blue – a constant defined in the AWT.

3 This method draws a filled oval in the current colour. The parameters are the x, y location, then the width and height.

4 If you decide that you don't want to use the default font then you must create a new one. A new instance of the Font class requires a typeface, style (Font.BOLD is a constant) and point size in order to initialise itself.

5 The Graphics object is told to use the newly created font by means of its setFont method.

6 Changes the drawing colour to yellow.

7 Finally we plant a message inside the oval at co-ordinates (165,165).



↑ This is what the applet looks like when you press the button.

and place a label near the top. Double-click the button to bring up its event handler and add this line:

```
label1.setText("Hi!");
```

Java is case sensitive, so be careful. It is lower case l, lower case s, upper-case T. And don't miss the semi-colon. That's enough graft. Run your project by pressing the [F9] key, or by using the green right arrow button in the toolbar. Accept the JDK license agreement if this is your first run. You should then see your applet running. Pressing the button changes the label text. Close the window.

Applets on the Web

The next thing to be done is getting the applet onto a Web page, but how is this done? Open Windows Explorer and navigate to the myclasses folder in your JBuilder installation. This is where the output files are generated. The HTML test file is there, along with a FirstApplet folder containing the class file

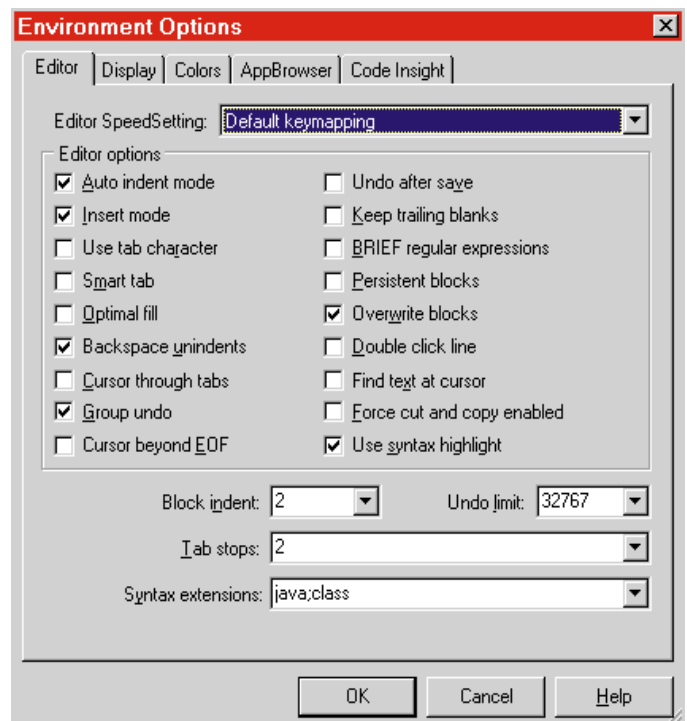
(which is the actual applet) and there are some other gubbins.

Double-clicking the HTML file should open it in your browser, displaying a rectangle where the applet should be... but there is no applet. To remedy this, you should close the browser and go back to JBuilder. On the Wizards menu select Deployment Wizard. This is where you will be able to package up the necessary files to distribute the applet into a single compressed archive called a JAR. Go for the compressed JAR option and change the name from Untitled1.jar to firstapp.jar. Then click Finish.

Back in the myclasses folder, the JAR file will have appeared. Open the HTML file in Notepad and add this after the CODEBASE line:

```
ARCHIVE="firstapp.jar"
```

Some browsers can be picky about filenames so stick to all lower case. Save the file, double-click again. Your applet should now appear in all its glory. **PCP**



↑ If the editor's formatting doesn't match your coding style, change it from Tool / Environment Options.



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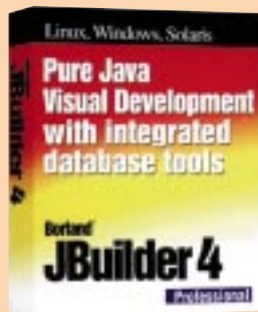
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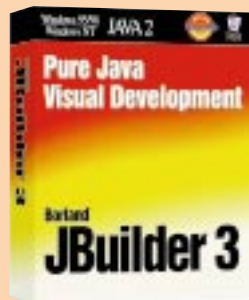
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DVD encyclopedia

Websters world Encyclopedia DVD Edition



Let our full DVD encyclopedia take you on a fascinating journey of discovery and wonder

Exclusive to the **SuperDVD** this month, we have Webster's World Encyclopedia - DVD Edition. This is a truly amazing piece of multimedia reference software, with over 3GB of information. It features over 10 million words, 50,000 articles, 20,000 biographies, 12,000 photographs, over 100 full screen movies and a dozen full-length documentaries. All very impressive statistics but what do they actually mean? Well, this month's exclusive DVD application is perfect for people that want to find out more about the world, from schoolchildren on a project deadline to anyone who wants to discover more about aardvarks, bacon, pyramids, xylophones or virtually anything else!

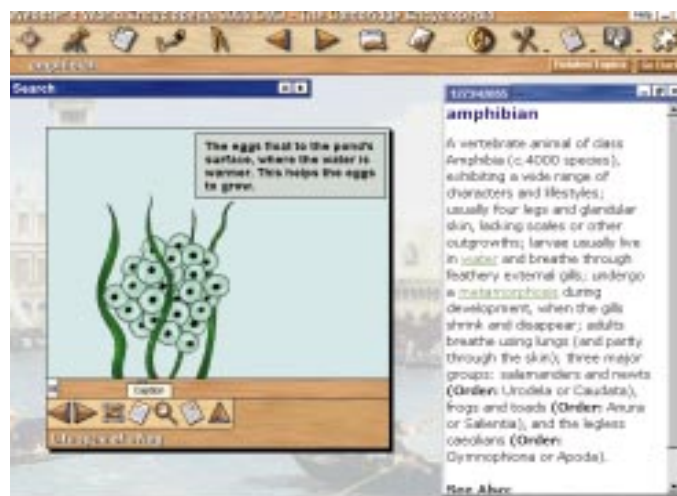
What's in it?

Although it calls itself an encyclopedia, Webster's is actually much, much more. Crank up the Contents screen and you'll find a load of options. First up is Exploring the Past, where you can journey into the worlds of yesterday and find out fascinating facts about the way we, and others, used to live.

Our World and Beyond is a collection of more modern events and facts to do with the world we live in today. Here you'll find complete day-to-day news stories from 1996 up to the beginning of 2000, information about the United Nations and lots more. There's also a fully featured atlas and a book about the major historical events of the twentieth century.

Word up

As well as all this, there are two full dictionaries contained within the



↑ Animated frog spawn, anyone?

Webster Encyclopedia. One is a standard English dictionary, with spellings and meanings for all those words you can never quite remember how to spell. You'll also find a natural history dictionary, which includes in-depth information on a host of subjects from amoebas to platypuses.

Moving into the Multimedia Interaction section, there's a foreign phrase book so you can learn all those usual phrases such as: 'I'd like to buy the purple giraffe' in a variety of languages. Also in this section, there's a Lunar Lander game where you have to land the lunar module without disturbing Neil Armstrong's equanimity, there's also a Star Gazer in which you can become Patrick Moore and view the night sky from anywhere in the world. On This Day shows you important world events that happened on this day from 1996 to 1999, although for some reason it misses out **PC Plus'** on-sale dates each month.

Video star

The video section includes twelve full length documentaries in MPEG form. You don't need a DVD decoder card to watch them - just click and enjoy! The videos cover many major historical events, including the Secrets of the Pyramids, Holocaust: Man's Darkest Hour and Leonardo da Vinci: Man for all Seasons.

Once you've watched a video, found a definition or been surprised by a factoid, you can create a tour to guide other knowledge seekers around your favourite parts. There are several tours already programmed into the encyclopedia but to make the most of it you should get your hands dirty by trying out as much as you can.

Finally, to make sure you're always up-to-date, Webster's has an Internet connection option, which accesses more information from its dedicated Web site.

Adam Evans